Cognitive aspects of post-traumatic stress disorder in children and adolescents

Meiser-Stedman, Richard Alexander

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Richard Meiser-Stedman

Institute of Psychiatry

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Abstract

It has been established that children and adolescents can develop post-traumatic stress disorder (PTSD) in response to traumatic events, such as technological disasters and wars. However, this research has focused principally on the prevalence of PTSD in this age group. A number of key issues surrounding children and adolescents' responses to trauma, including the nature of post-traumatic stress symptomatology and the factors related to the onset and maintenance of the disorder, have yet to be examined.

Two studies were designed to test the applicability of recent cognitive models of PTSD in adults to children and adolescents. Study 1 involved investigating PTSD symptomatology in a non-clinical sample drawn from secondary schools. Children and adolescents aged 11-18 years (n=254) completed self-report questionnaires regarding a recent frightening event. These questionnaires examined the quality and frequency of intrusive memories of the event, strategies for coping with these memories, and appraisals of the event and its sequelae. Study 2 was a prospective-longitudinal study of children and adolescents aged 10-16 years (n=106) who had attended an Accident and Emergency department in South London following an assault or road traffic accident. Participants in this study were assessed by way of a semi-structured interview schedule and completed self-report questionnaires regarding psychopathology, cognitive styles, trauma appraisals, and coping strategies.

Regression analyses of both Study 1 and Study 2 responses revealed the importance of cognitive styles and trauma memory quality (as opposed to demographic and trauma-related variables) in the aetiology of PTSD. Regression analyses of Study 2 responses distinguished between onset and maintenance processes in the aetiology of PTSD, and revealed the relative effect of these processes in causing PTSD and depression. These results are discussed with regards to the theoretical understanding of PTSD in children and adolescents, the treatment offered to this population, and suggestions for future research.

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Chapter 1: Introduction and rationale

1.1 General Introduction

It has only been acknowledged during the past 15 years or so that children and adolescents may suffer from PTSD. In a major review in the early 1980s of children's responses to trauma, Garmezy and Rutter (1985) concluded that children's reactions to trauma were not as serious as those developed by adults, and that children's reactions did not warrant inclusion within the newly formulated diagnostic category of PTSD. This was due particularly to there being no reports that children exposed to disasters displayed PTSD-specific symptoms such as amnesia, psychic numbing, or intrusive flashbacks.

Particular barriers to the understanding of children's reactions to traumatic events were quickly highlighted. Yule and Williams (1990) pointed out that studies of children exposed to trauma are difficult to conduct due to the tendency of adults to be highly protective towards such children and deny that children can suffer psychiatric disturbance following trauma. In addition, these authors noted that one of the earliest studies (Galante & Foa, 1986) had not used scales appropriate for detection of traumatic stress reactions in children.

A more detailed understanding of PTSD in children and adolescents was derived from the use of assessment measures designed specifically for PTSD. The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979) was utilized in a study of children involved in the *Herald of Free Enterprise* ferry disaster (Yule & Williams, 1990). Children assessed using this self-report measure were found to score in a similar fashion to adults. The PTSD Reaction Index (PTSD-RI), a structured interview based on the DSM-III diagnostic criteria for PTSD (APA, 1980), was used by Pynoos et al. (1987) to assess children who had witnessed a fatal sniper attack on their school playground. Children in the playground at the time of the shooting were very likely to develop PTSD, with 77% developing moderate to severe levels of PTSD.

These key articles that helped to bring about an acceptance of the validity of the PTSD diagnosis in children utilized scales and interviews based on diagnostic criteria initially designed for adults. The study of reactions to traumatic events has been conducted formally for several more years within the adult population, and a number of theories concerning the aetiology of PTSD have been suggested. Before theoretical insights can be gleaned from research on adult populations subjected to trauma however, the issue remains of whether it is appropriate to continue to assume that child PTSD is essentially the same disorder as that found in adults.

It is the purpose of this thesis to advance the understanding of children and adolescents' reactions to traumatic events and examine how such an understanding may benefit from models of PTSD in adults. This introductory chapter will comprise several sections. First, a brief critical review of theoretical accounts of PTSD in children and adolescents will be provided. Secondly, two recent cognitive models of PTSD in adults that have been shown to account for many of the key features of PTSD and have generated testable hypotheses will be outlined. Third, evidence concerning the pattern of re-experiencing observed in children will be considered. Fourth, the time course of PTSD in children and adolescents, and the relevance of the Acute Stress Disorder (ASD) diagnosis, will be discussed. Fifth, psychosocial factors implicated as having a role in the aetiology of child and adolescent PTSD will be outlined. Sixth, the applicability of cognitive processes proposed in adult models of PTSD to PTSD in children and adolescents will be discussed. Finally, a summary of this introduction and a rationale of the studies undertaken for this thesis will be provided.

1.2 Current understanding of PTSD in children and adolescents

PTSD is categorised within DSM-IV (APA, 1994) as an anxiety disorder. The diagnostic criteria of PTSD are displayed in Table 1.1. Only two notes are entered into the diagnosis (both regarding the re-experiencing symptoms of criterion B) in order to account for ways in which PTSD in young children differs from PTSD in adults. Thus, even in the diagnostic formulations of the disorder, PTSD in children

and adolescents is not considered to be significantly different from PTSD in adults. In this section, a brief overview will be provided of the most significant conceptualizations of PTSD in children and adolescents that have been offered over the past 15 years. The models were selected so as to provide an idea of the breadth of theoretical perspectives adopted so far in trying to understand children's responses to trauma, and the selection is by no means comprehensive.

Pynoos and colleagues (Pynoos, Steinberg, & Wraith, 1995; Pynoos, 1994; Pynoos, Steinberg, & Goenjian, 1996; Pynoos, Steinberg, & Piacentini, 1999) have considered children and adolescents' reactions to trauma within a developmental life-trajectory model. A child's short-term reaction to a trauma is considered to be moderated by four groups of factors: i) proximal trauma reminders (e.g., external and internal cues, physiological reactivity), ii) proximal secondary stresses (e.g., changes to family and community circumstances), iii) the "ecology" of the child (e.g., parental, school and peer factors), and iv) factors intrinsic to the child (e.g., genetic predisposition, developmental competencies). In particular, it is argued that "the etiology of posttraumatic *distress,* [is derived from] the nature of the *traumatic experience(s)* and from the subsequent *traumatic reminders* and *secondary stressors* [Pynoos, Steinberg, & Wraith, 1995, p. 72; the italics are the original author's]". A child's long-term reaction and adjustment is likely to be related to ongoing reminders of the trauma and persistent secondary stressors (e.g., physical disability, legal proceedings, etc.).

Table 1.1 DSM-IV Criteria for Post-traumatic Stress Disorder

A. The person has been exposed to a traumatic event in which both of the following have been present:
   1. The person has experienced, witnessed, or been confronted with an event or events, that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others.
   2. The person's response involved intense fear, helplessness, or horror. Note: In children, it may be expressed by disorganized or agitated behavior.

B. The traumatic event is persistently re-experienced in at least one of the following ways:
   1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
   2. Recurrent distressing dreams of the event.
      Note: In children, there may be frightening dreams without recognizable content.
   3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated).
      Note: In young children, trauma specific reenactment may occur.
   4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
   5. Physiological reactivity upon exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:
   1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma.
   2. Efforts to avoid activities, places, or people that arouse recollections of the trauma.
   3. Inability to recall an important aspect of the trauma.
   4. Markedly diminished interest or participation in significant activities.
   5. Feelings of detachment or estrangement from others.
   6. Restricted range of affect (e.g., unable to have loving feelings).
   7. Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span).

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by at least two of the following:
   1. Difficulty falling or staying asleep.
   2. Irritability or outbursts of anger.
   3. Difficulty concentrating.
   4. Hypervigilance.
   5. Exaggerated startle response.

E. Duration of the disturbance (symptoms in B, C, and D) is more than 1 month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

   Specify if:

      Acute: If duration of symptoms is less than 3 months.

      Chronic: If duration of symptoms is 3 months or more.

   Specify if:

      With delayed onset: Onset of symptoms at least 6 months after the stressor.

This conceptualisation is important as it integrates existing psychodynamic, familial, cognitive-behavioural and psychopharmacological approaches to children and adolescents' reactions to trauma, and leaves little doubt as to the dramatic impact of "the legacy of trauma". With regards to future research, Pynoos and colleagues advocate the investigation of a number of areas, including the development of brain mechanisms and how PTSD intersects with other anxiety disorders over the life span.

In a review of the literature concerning PTSD in children and adolescents, Fletcher (1996) adopted a multi-factorial model similar to that of Pynoos and colleagues. Fletcher concluded that children react to trauma in a way very similar to that of adults, and called for further research to examine why it is that some children develop PTSD while others do not. He also stressed that factors other than those relating to exposure to trauma must be investigated.

Schwarz and Perry (1994) emphasized the neurobiological impact of a traumatic event, noting that acute stress results in the increased activation of the noradrenergic system which plays an important role in a number of behaviours that are readily identified as being related to PTSD; arousal regulation, vigilance, irritability, locomotion, attention, sleep, and the startle response. The neurobiological changes thought to result from traumatic stress also "create an adaptive record of survival-related information [Schwarz & Perry, 1994, p.312]". Such records, termed "malignant memories" by Schwarz and colleagues (Schwarz & Kowalski, 1991; Schwarz, Kowalski, & Hanus, 1993), are hypothesized to possess a neural network architecture and incorporate information derived from the traumatic event that that has a potential bearing on the individual's survival.

The activation of these memories by trauma-related cues results in the individual experiencing high levels of noxious arousal, and potentially, cognitive distortions, memory changes, dissociative states, and altered behavioural and affective activity. It is further noted from animal studies that the developing brain is particularly sensitive to stress, especially when such stress is unpredictable and uncontrollable. The authors proposed therefore that children exposed to trauma may develop brains with dysregulated neurophysiological systems and

neuroanatomical structures that may leave them more vulnerable to suffering from exposure to psychosocial stressors when they reach maturity. The authors described how younger children exposed to trauma may experience a more pervasive and persistent increase in basal autonomic tone and develop a post-traumatic reaction where symptoms are elicited by more general stimuli that are unrelated to the trauma.

An integrative conceptual model that incorporated exposure to trauma, child characteristics (such as gender and age), access to social support and coping styles was tested in a sample of elementary school-aged children exposed to a hurricane (Vernberg, La Greca, Silverman, & Prinstein, 1996). Vernberg et al. found that the four factors identified in the model were together able to predict a considerable amount of the variance in PTSD symptomatology. This study is of importance as it compares the relative importance of exposure variables to non-exposure variables such as social support and coping, and identifies specific targets for treatment (e.g., the use of blame and anger). Follow-up investigations of the same sample of children (La Greca, Silverman, Vernberg, & Prinatein, 1996) found that at seven and 10 months after the disaster the model accounted for less variance in PTSD symptomatology. Although a considerable number of children thought they might die during the hurricane (60%), far fewer were hurt or actually witnessed other people being hurt during the event. The success of the model in predicting children's reactions may result partly from investigating a sample exposed to a comparatively moderate trauma where the protective effects of social support and coping may be more pronounced. Nevertheless, this study presents a significant advance in the methodology and theory used in the investigation of children's responses to trauma.

A number of reviews, while not proposing a specific model of PTSD in children and adolescents, have outlined etiological factors that have been shown to predict the occurrence of the disorder (Amaya-Jackson & March, 1995; Vogel & Vernberg, 1993; Pfefferbaum, 1997; American Association of Child and Adolescent Psychiatry, 1998; Foy, Madvig, Pynoos, & Camilleri, 1996; Gurwitch, Sullivan, & Long, 1998; Yule, Perrin, & Smith, 1999). The most widely accepted predictor of PTSD is exposure severity, while sex, prior exposure to trauma, prior

psychiatric disorder, and family functioning also seem to be emerging as having predictive value. A less clear picture exists of the relationship between variables such as age and ethnicity and post-traumatic stress reactions.

A recent review has examined how a cognitive theory of childhood PTSD needs to accommodate developmental factors (Salmon & Bryant, 2002). The authors of this review highlight the need to consider developmental issues that have a bearing on how a child may encode and then resolve a traumatic experience. The development of language is thought to be of particular importance, both when a trauma is experienced, and when a child attempts to deal with the traumatic event. The social world of the child is examined, and the role of the family in assisting a child to form complete memories of a trauma is stressed. The authors conclude by providing a relatively clear description of how developmental issues might be considered in both the assessment and treatment of children suffering from PTSD. The role of the family in both assessment and treatment is stressed, in particular the potential negative effect that parents may have in reinforcing a child's avoidant coping. Methods for supporting young children to communicate their experiences and the empirical support for providing such assistance are described.

The reviews described above have demonstrated how the understanding of children and adolescents' reactions to traumatic experiences has been advanced by incorporating theory from a variety of domains. Many studies have been directed at examining core assumptions regarding the nature of PTSD in children, such as the pattern of symptomatology observed in children following trauma. The need for further research into a number of aspects of children's reactions is widely acknowledged. Yet, it remains the case that such research is rarely driven by a coherent model that explains the processes that are involved in the formation of specific PTSD symptoms such as intrusive memories, flashbacks, and hyperarousal. The adoption of such a theoretical account may offer clearer guidelines as to how research may be directed beyond examining demographic and psychosocial variables.

Clearly, a theoretical account of PTSD in children and adolescents will need to be able to encompass the full range of aberrations of behaviour, cognition,

physiology, and consciousness that are associated with PTSD within a developmental context. Existing models have demonstrated a degree of success in accounting for these aberrations, yet inadequacies are also present. For example, Schwarz and Perry (1994) considered the role of developmental neurobiology with regards to specific PTSD symptoms. Similarly, Salmon and Bryant (2002) placed their discussion of childhood PTSD in the context of "fear networks" (Foa, Steketee, & Rothbaum, 1989). However, the kinds of single-level representations of emotion proposed within these accounts are limited in their explanatory power (Power & Dalgleish, 1997), especially with regards to some of the more disturbing symptoms of PTSD, such as flashbacks and emotional numbing; such accounts cannot explain the discontinuity between the re-experiencing of traumatic events, where adults and children may experience overwhelming sensations as experienced at the time of the trauma, and the normal, voluntary activation of autobiographical memories. Many models of child PTSD, particularly those of Pynoos and colleagues, Fletcher (1996), and Vernberg et al. (1996), are often vague, fail to make testable predictions, and try to relate PTSD to a number of processes, such as social support, that equally might be involved in a number of other psychiatric disorders, e.g. depression and generalised anxiety. Outlined in the next section are two cognitive models of PTSD in adults, that assume multi-level representations of traumatic events, make specific predictions regarding the aetiology of the disorder, and which may inform the development of a model of PTSD in children and adolescents.

1.3 Cognitive Models of PTSD in Adults

1.3.1 Brewin et al.'s (1996) Dual Representation Model of PTSD

Brewin, Dalgleish, and Joseph (1996) suggest that the complex pattern of symptomatology observed in individuals with PTSD could be explained by a dual representation model, where the memories of the traumatic event are stored in a different manner to normal memories. These memories remain in a sensory format and are hypothesized to be represented within different neural structures than normal memories.

Brewin (2001) has presented evidence from a cognitive neuroscience perspective that suggests "traumatic memories" are laid down in a way that bypasses the hippocampus, the neural structure considered to be responsible for the encoding of memories within a temporal and spatial context. As a result of this difference in information processing, "the sensory (visual, auditory, olfactory, etc.), physiological, and motor aspects of the traumatic experience are represented in situationally accessible knowledge in the form of analogical codes that enable the original experience to be recreated" [Brewin et al., 1996, p.676-677]. Such representations, termed "situationally accessible memories" (SAMs) by Brewin et al. (1996), are re-experienced as the result of elicitation through associative learning; trauma-related cues will be likely to trigger such re-experiencing. This qualitative difference in representation also means that traumatic memories are not easily accessible by conscious means.

Such an account gives a powerful explanation of the cardinal cluster of symptoms observed in individuals with PTSD: the re-experiencing phenomena. The difference in representation may account for how flashbacks are experienced frequently as dissociative states. The conscious activation of SAMs is thought to allow changes in such representations of a traumatic event, whereby conditioned emotional responses are extinguished through a process of "spontaneous or programmed habituation" [p. 678]. Such habituation, and the associated normalization of attentional and memory biases, is responsible for decreasing the likelihood of intrusively re-experiencing the traumatic event.

However, the full resolution of a traumatic event also may be contingent on an individual's verbally accessible memory (VAM) of the event. VAMs are theorized to consist of representations of a person's conscious experience of a traumatic event, such as sensory features, emotional and physiological reactions, and the perceived meaning of the event. Significantly such a representation is likely to be subject to deliberate retrieval from an individual's store of autobiographical memories. Brewin et al. (1996) stressed that "secondary emotional reactions arising from subsequent conscious appraisal" [p. 682] may interfere with the emotional processing of a traumatic experience. Attributions of responsibility made after a traumatic event, leading to emotions such as guilt or anger, in

addition to being themselves distressing, may prevent the habituation of fear when SAMs are activated. Therefore, the authors suggest that prior to the use of exposure treatment, such secondary emotions be addressed using cognitive techniques.

Brewin et al. (1996) go on to describe three endpoints of emotional processing that arise from the dual representation theory proposed. The first endpoint, completion or integration, results when memories of the traumatic event have been fully "worked through", and are integrated with the individual's other memories and sense of self in the world. In particular, the individual will have habituated to their SAMs of the event. The second endpoint, termed "chronic emotional processing", concerns the presence of unremitting PTSD, and is thought to be associated with inability to integrate memories of the trauma. This may be the result of aversive secondary emotions, as described above, the lack of social support to assist processing of SAMs or VAMs, and ongoing trauma, among other causes. In addition to the symptoms of PTSD, an individual caught in this stage will continue to have attentional and memory biases towards trauma-related information, and develop more generalized secondary reactions. The third possible endpoint of processing, "premature inhibition of processing", results when the individual succeeds in avoiding the activation of unpleasant SAMs and VAMs. While the triggering of negative affect may be automatically avoided by the development of "avoidance schemas", the individual will continue to have attentional biases, impaired memory for the trauma, avoidance for trauma-related stimuli, and possibly somatization.

1.3.2 Ehlers & Clark's (2000) Cognitive Model of PTSD

The second of this new generation of models of PTSD in adults is that of Ehlers and Clark (2000). Ehlers and Clark (2000), in a similar fashion to Brewin et al. (1996), place particular emphasis on the pathological role of "trauma memory", highlighting processes that are involved in laying down of such memories, and the cognitions, meta-cognitions and thought control strategies considered responsible for the maintenance of PTSD. Ehlers and Clark argued that the combination of trauma memory and the negative appraisal of trauma and its sequelae result in a

perception of "current threat" that is accompanied by intrusive phenomena, hyperarousal, anxiety and other emotional responses.

Ehlers and colleagues have demonstrated the maintaining effect of a sense of "current threat" in victims of physical and sexual assault (Dunmore, Clark, & Ehlers, 1999), political prisoners (Ehlers, Maercker, & Boos, 2000), and motor vehicle accident (MVA) survivors (Ehlers, Mayou, & Bryant, 1998; Steil & Ehlers 2000). In addition to the presence of poorly elaborated trauma memories (the recall of which is easily triggered by associated cues), a number of cognitions and meta-cognitions are thought to give rise to this mental state. These include: Dysfunctional meaning attached to symptoms of the trauma (e.g., believing that having flashbacks is a sign that one is "going mad"); Perceived negative responses from others (e.g., "people think I am too weak to cope on my own"); A sense of permanent change (e.g., "my life is ruined"); And change in global beliefs (e.g., "the world is a dangerous place").

The power of meta-cognition to impede recovery from the acute phase of the disorder was demonstrated by Steil and Ehlers (2000) in their finding that the distress caused by re-experiencing symptoms of MVAs was related to the idiosyncratic meaning assigned to the symptoms (e.g., believing that intrusive thoughts are a sign that one is going "mad"). This relationship existed regardless of intrusion frequency, accident severity, and general anxiety-related catastrophic cognitions. In addition, dysfunctional meaning attached to traumatic symptoms was found to be associated with maladaptive coping strategies such as avoidance, thought suppression (an active effort to rid one's mind of a cognition), rumination and distraction. These strategies are considered to discourage the full processing of traumatic memories, and in the case of thought suppression, paradoxically encourage the production of distressing intrusive cognitions. A considerable body of work has shown that thought suppression (see Purdon, 1999, for a review) is responsible for an increase in the frequency of intrusive thoughts and memories.

Thus, cognitions and meta-cognitions that are formed after a traumatic event may promote the maintenance of PTSD in two ways. Firstly, dysfunctional cognitions and meta-cognitions produce a sense that the trauma continues to have damaging

implications, and consequently generate a feeling of apprehension. Secondly, the thought control strategies that result from these appraisals can discourage emotional processing of memories of the traumatic event. These cognitions and coping strategies may explain how a substantial proportion of traumatized adults emotionally engage in exposure treatments and yet do not proceed to habituation of the memories (Jaycox, Foa, & Morral, 1998). Therefore, Steil and Ehlers (2000) suggest that "therapeutic strategies aimed at identifying, restructuring, and changing the negative idiosyncratic meaning of posttraumatic intrusions should be helpful in alleviating posttraumatic symptomatology" [p. 555].

Ehlers and Clark (2000), like Brewin et al. (1996), consider exposure to be an integral part of cognitive behavioural interventions for PTSD, but argue that the adoption of cognitive restructuring during reliving may be useful. In this way problematic appraisals associated with key moments of the trauma may be identified and discussed, and the full benefits of exposure can be attained. While Ehlers and Clark expound more the potential role of cognitive techniques in the treatment of PTSD in adults, and do not base their account on a dual representation account, there exists, however, relatively few significant conceptual differences between their model and that of Brewin et al. (1996). Each accounts for the extreme nature of the re-experiencing symptoms of PTSD, and the variation in outcome between survivors of trauma. In particular, the onset and maintenance of PTSD symptomatology are distinguished. The early onset of intrusive phenomena is considered a normal reaction to an extreme event (especially after more severe trauma). The maintenance of such symptoms is considered to result from a variety of maladaptive responses.

1.4 The nature of children and adolescents' memories of trauma

While children and adolescents have been found to possess the same two-factor structure of re-experiencing and avoidance observed in adults (Dyregrov, Kuterovac, & Barath, 1996), particular consideration must be given to children's memories of traumatic events. Theorists positing a cognitive approach to PTSD in adults (Brewin et al., 1996; Ehlers & Clark, 2000) regard the re-experiencing

phenomena of the disorder not only to be its primary distinguishing feature, but also to be indicative of the central underlying abnormality that is responsible for the disorder: the nature of the memories of a traumatic event. These and other authors (e.g., van der Kolk, 1996) argue that traumatic events may be poorly encoded in memory, resulting in primitive representations of events. In addition such representations may also play a considerable role in maintenance of the hyperarousal cluster of symptoms, as the physiological changes encoded during the traumatic event are re-experienced.

It is essential therefore to consider whether the re-experiencing symptoms children experience are like those of adults; that is, whether such symptoms are the result of triggering involuntary recall of poorly elaborated, sensory based memories of the traumatic event. With regards to this, there is a growing body of research regarding the elicitation, form, and treatment of traumatic memories in children. Three avenues of research have addressed the issue of the existence and role of traumatic memories in children and adolescence: clinical reports of children's memories of traumatic events, symptomatology profiles of samples of children exposed to trauma, and studies that have examined specifically the nature of children's memories of traumatic events.

1.4.1 Clinical reports of children's memories of traumatic events

The landmark case studies conducted into children's reactions to traumatic events examined a small sample of 5-14 year-old children involved in the Chowchilla bus kidnapping (Terr, 1981). Terr reported the presence of some symptoms that would be considered to fit DSM-IV criteria for re-experiencing: Nightmares or bad dreams with some content pertaining to the kidnapping, "posttraumatic play", and behavioural re-enactment. Flashbacks, however, were not observed in the children. Terr described how older children reported daytime visions of the kidnapping, but suggested that these re-experiencing episodes were voluntary.

In a four-year follow-up study of these children, Terr (1983) reported that their memories of the kidnapping were largely unchanged, and that such memories were still recalled with a "vivid immediacy". A significant number continued to

engage in posttraumatic play and behavioural re-enactment, a variant of posttraumatic play which was considered to be less "fun", and very often involved the re-experiencing of psychophysiological responses experienced during the kidnapping. Behavioral re-enactment is a feature of children's reactions to trauma that may be readily conceptualised within the dual representation theory of Brewin et al. (1996) as the elicitation of motor responses recorded during the trauma.

Perrin, Smith and Yule (2000) share the view that children and adolescents can suffer from intrusive thoughts about a traumatic event, adding that such phenomena can occur either when falling asleep or when triggered by external or internal reminders. Perrin et al. (2000) also briefly overview the debate regarding the reactions of very young children to trauma, noting that while evidence exists to suggest that this group does not suffer from visual flashbacks, they can display signs of re-experiencing through vivid re-enactment of the trauma (Scheeringa & Zeanah, 1995; Scheeringa, Zeanah, Drell, & Larrieu, 1995). In short, many clinical reports note that children 're-see' or 're-feel' the trauma (Terr, 1991) and acknowledge the different sensory modalities that such experiences may take.

1.4.2 Symptomatology profiles of samples of children exposed to trauma

Beyond clinical reports, a number of studies have shown that the full range of re-experiencing symptomatology is found in children and adolescents who have been exposed to traumatic events. A summary of these studies is shown in Table 1.2. This table illustrates that children and adolescents can experience the full-range of re-experiencing symptomatology. At the same time, there exists considerable variability across studies in the prevalence of specific forms of re-experiencing. This may be due in part to the nature of the traumatic event, or may highlight the need for considering developmental issues when assessing PTSD in children and adolescents (McNally, 1991, 1996; Yule & Williams, 1990).

Table 1.2 DSM-IV re-experiencing symptoms endorsed in studies of children and adolescents exposed to traumatic events.

Authors	Traumatic Incident	N	Age range	Percentage endorsing Re-experiencing symptoms				
				Symptom B1: 'intrusive recollections of traumatic event'	Symptom B2: 'distressing dreams of event'	Symptom B3: 'flashbacks'	Symptom B4, 'distress on exposure to reminders'	Symptom B5, 'arousal on exposure to reminders'
Becker, et al. (1999)	Ethnic cleansing	10	13-19	70.0	20.0	10.0	70.0	30.0
Bradburn (1991)	Earthquake	22	10-12	50.0	27.0	-	-	-
Dyregrov, et al. (2000)	Genocide in Rwanda	1830	8-19	71.4	-	45.0	-	77.3
Green, et al. (1991)	Dam Collapse	179	2-15	8.0	30.0	-	65.0	11.0
Malmquist (1986)	Witnessed murder of parent	16	5-10	88.0	81.0	-	-	56.0
Pynoos, et al. (1987)	School shooting	159	5-13	54.0	46.0	45.0	-	-
Thabet & Vostanis (1999)	War	239	6-11	16.8	13.1	-	18.8	9.6

A hyphen indicates that no appropriate symptom was recorded in the paper.

A meta-analysis conducted by Fletcher (1994, unpublished manuscript) examined 34 studies of children exposed to trauma (with a total sample size of 2, 697) and found similar rates of PTSD in child and adult samples. Fletcher (1996), in discussing these findings, concluded that the DSM-IV diagnosis of PTSD could be applied to all child age groups. While the pattern of symptomatology in Fletcher's meta-analysis for preschool children appears to be different to that of school- and teen-aged children (with pre-school children found to be more frequently distressed by reminders of the trauma, have bad dreams regarding the trauma, and engaging in post-traumatic play), this meta-analysis does underscore the general acceptance that children re-experience traumatic events.

1.4.3 Quantitative studies of children's memories of traumatic events

The finding that children and adolescents experience unwanted thoughts of traumatic events, have "flashbacks" (albeit not young children), and experience physiological arousal on exposure to trauma-related cues, supports the suggestion that children and adolescents can form SAMs of traumatic events. Further evidence suggesting that some children's memories of traumatic events are comparable to the concept of SAMs comes from the few studies that have sought to assess the nature of these memories in children quantitatively.

Burgess, Hartman, and Baker (1995) adopted a conceptual framework that incorporated neurobiological, information processing and psychodynamic approaches in their study of the memories of 34 physically and sexually abused children. The somatic, behavioural, verbal, and visual qualities of the children's memories were examined. Somatic and behavioural memories of trauma were very common and clearly related to the sexual nature of much of the abuse that was endured by the children in this sample. Most children's memories had a visual quality, though this finding was based on noting whether children were able to draw elements of the trauma they were exposed to. Such an indicator is likely to be highly insensitive due to children's lack of artistic ability or unwillingness to draw their experiences. Verbal

memories were of a varying quality, though only three children expressed no memory at all of what happened to them.

Further data concerning the quality of children's memories of trauma have been obtained from one study of pre-school aged children exposed to an extreme natural disaster. Azarian, Lipsitt, Miller, and Skriptchenko-Gregorian (1999) assessed 90 children, aged 10-44 months, after the 1988 Armenian earthquake. More than half of the sample had verbal memories of the earthquake, and nearly all displayed what the authors termed "non-verbal" memories: repetitive earthquake-related play, nightmares, and physiological and somatic reactions that were produced in reaction to specific reminders of the earthquake. An important finding of this study was that memory quality varied across the age range. The youngest age group, that of children aged 10-24 months, contained significantly fewer children with verbal memories than the two older groups, while the rates of non-verbal memory presentation remained approximately equal across the age span.

The two studies discussed above lend weight to the possibility that children exposed to trauma can have non-verbal memories similar to the SAMs described by Brewin et al. (1996). It is noteworthy that Azarian et al. (1999) found that very young children had no verbal memories of the earthquake that they were exposed to, yet possessed non-verbal memories at the same rate as older children. That such young children lack verbal memories is entirely in keeping with their linguistic development (see Salmon & Bryant, 2002, for further discussion of this). However, if the ability to form verbal memories is protective, this group would have been expected to demonstrate more non-verbal memories than older children, who with their more developed linguistic and cognitive abilities may have been more able to process the traumatic event. Brewin and colleagues note that adults with PTSD following a trauma may have some verbal account of the event, but that such accounts are likely to be fragmentary and more biased to describing sensory rather than semantic aspects of what occurred.

In conclusion, it is suggested from the existing evidence that Brewin et al.'s (1996) concept of SAMs may be of explanatory relevance to children's reactions to trauma. Like adults' re-experiencing of traumatic events, children are likely to possess emotion-laden memories composed of sensory fragments, that are easily elicited by reminders of the event, and can be experienced in the present as intrusive memories and "flashbacks". Further studies of the memories of a greater age range of children are necessary to investigate this proposal. These should include prospective studies that examine the relationship between memory quality and PTSD symptomatology.

The finding of Azarian et al. (1999) that the presence of verbal memories in young children may not be protective against the development of non-verbal memories is in particular need of replication. If this is the case, then other barriers to the formation of coherent and non-intrusive memories other than linguistic ability will need to be investigated, such as emotional regulation and willingness to confront fear-eliciting internal or external stimuli. Indeed, one of the advances of the recent adult cognitive models of PTSD is the realization that while verbalizing a traumatic event is a necessary step in the processing of the event, other aspects of the traumatic memory also may need to be modified. Commentators on PTSD in children have drawn attention to young children's limited ability to encode an event in a verbal form (Fivush, 1998; Salmon & Bryant, 2002). Future studies may be beneficially directed towards other aspects of children's memories of trauma. Similarly, dissociation, which is considered to play a significant role in the onset of PTSD in adults by interfering with the process of forming a coherent memory of a traumatic event, has received little attention in studies of children and adolescents exposed to trauma.

1.5 The time course of PTSD symptomatology in children and adolescents

A significant component of both Brewin et al.'s (1996) and Ehlers and Clark's (2000) models of PTSD is that the time course of PTSD is considered critical. That is, the occurrence of PTSD symptoms soon after a traumatic event is not considered abnormal, and may even be relatively common. Chronic PTSD, however, is thought

to occur in only a minority of individuals whose psychological recovery following a trauma has been impeded in a number of ways as outlined above.

Before considering evidence that suggests that the same processes that prevent recovery following a trauma operate in children and adolescents as operate in adults, an examination of the findings regarding the time course of children's and adolescents' reactions to trauma is warranted. In addition, a discussion surrounding Acute Stress Disorder (ASD), a diagnosis introduced only in the most recent version of DSM in 1994, will be presented.

1.5.1 Prospective studies of children's and adolescents' responses to trauma

In this sub-section a number of studies of the time course of children and adolescents' responses to a variety of traumatic events will be outlined. Space does not allow for a comprehensive review of studies that examined prospectively young people's PTSD reactions, but the studies selected illustrate the broad range of traumatic events investigated.

1.5.1.1 Road traffic accidents

Child and adolescents victims of road traffic accidents (RTAs) have been one of the most commonly studied populations with regards to PTSD. This has been due to the relative frequency of these events, their generally occurring as discrete, one-off events, and the ease with which survivors of RTAs can be approached via Accident and Emergency departments. In the last few years alone several prospective studies of children and adolescents exposed to RTAs have been performed.

Di Gallo, Barton and Parry-Jones (1997) assessed 57 children and adolescents (aged 5-18 years) who had attended accident and emergency departments in Glasgow following RTAs. While a small sample, the participation rate was high (77%), and participants were assessed shortly after their accident (mean 7.7 days). Follow-up

assessments were performed 12-15 weeks after the accident. The retention rate was also high (93.0%). Scores on the Revised Impact of Event Scale (R-IES; Horowitz et al. 1979) indicated a large drop-off in symptomatology between the two assessments, from a mean of 27.2 to a mean of 16.7 (effect size of d = 0.691; Cohen, 1988). Of the variables assessed, the child's or adolescent's distress immediately after the RTA was the greatest correlate of PTSD symptoms at the initial assessment and at follow up.

Stallard, Velleman, and Baldwin (1998) assessed 119 children and adolescents (aged 5-18 years) who had attended an accident and emergency department in Bath following an RTA. This sample was less representative than that of Di Gallo et al. (1997), with a participation rate of 43%. Initial assessments were conducted approximately 6 weeks after the accident. Semi-structured interviews conducted with both children and parents revealed that 34% of the children and adolescents suffered from PTSD. At 8 month follow-up, all children who had initially been diagnosed with PTSD were contacted and invited to be re-assessed, as well as a sample of children who had been initially found not to have PTSD (Stallard, Velleman, & Baldwin, 2001). Approximately half of the children who had initially been diagnosed with PTSD completed the follow-up assessment; of these children, 47.6% were diagnosed with PTSD. None of the children who were initially not diagnosed with PTSD went onto develop PTSD at the 8 month follow up.

Mirza, Bhadrinath, Goodyer, and Gilmour (1998) assessed 8-16 year old victims of RTAs 6 weeks and 6 months after their accident. The study sample was large (n=119) and a high participation rate (76%). The self-report questionnaire version of the PTSD Reaction Index (PTSD-RI; Frederick & Pynoos, 1988) was administered to children and adolescents and their parents at both time points. According to scores on this instrument, 45% of children and adolescents had mild to severe PTSD at initial assessment, while only 17% had mild to severe PTSD at six month follow-up.

Winje and Ulvik (1998) assessed the survivors of a severe bus accident involving Swedish school children who were travelling through Norway as part of an end-of-

year outing. Of 34 children and adults in the bus, 12 children and 4 adults died. In addition to actual survivors of the crash, the investigators assessed siblings of those children who either survived or died in the crash, at 1 year and 3 years post-trauma. Children completed the R-IES at each time point. Scores on both the intrusion and avoidance sub-scales of this instrument significantly decreased over time (effect sizes of d = 1.178 and 0.948 respectively; Cohen, 1988). While again demonstrating a significant reduction of PTSD symptomatology, these findings cannot be directly compared to other populations, due to the children and adolescents being recruited from a single trauma, and as the children and adolescents received an (undisclosed) intervention in the months following the accident.

1.5.1.2 Natural disasters

The study of children's and adolescents responses to natural disasters has often greatly enhanced the understanding of young people's reactions to trauma. The large numbers of children affected by such disasters has allowed for large and diverse cohorts to be investigated.

McFarlane (1987a) assessed children exposed to a bush fire in Australia. The parents of these 5-12 year old children, and their teachers, completed the appropriate Rutter scales (Rutter, Tizard, & Whitmore, 1970; Rutter & Graham, 1967) at 2, 8 and 26 months after the fire. Psychiatric morbidity (not PTSD) as assessed by these scores increased between the 2 month and 8 month assessment points, but showed no significant change from the 8 month assessments at 26 months. This increase in morbidity over time may be related to be a number of methodological shortfalls in the study. Not only do the Rutter scales fail to include child self-report, they also do not include items that relate specifically to PTSD. The increase in general psychiatric morbidity uncovered by these scales may be related less to a psychological reaction to the disaster itself (during which relatively few children may actually have been in danger), but to the ongoing impact of the disaster on the community. This study is important therefore in highlighting that PTSD is not the only form of psychiatric

disorder that can occur following a trauma, though what it tells us about PTSD reactions in children and adolescents is limited.

La Greca, Silverman, Vernberg, and Prinstein (1996) conducted a prospective study of 442 elementary school aged children who were exposed to Hurricane Andrew, a disaster that devastated much of Florida. The children were assessed at three time points after the hurricane hit, at 3, 7 and 10 months. Between the first and third assessments, the cohort's mean score on the PTSD-RI had decreased from 29.5 to 20.8 (an effect size of d = 0.518; Cohen, 1988), and the proportion of children with moderate to very severe PTSD, as assessed using the same measure, had decreased from 55.8% to 33.5%.

1.5.1.3 Large-scale transport disasters

Yule, Bolton, Udwin, Boyle, O'Ryan, and Nurrish (2000) conducted a long-term follow-up investigation of a large group of adolescents who had been involved in the *Jupiter* ferry disaster. At the time of the disaster, the 217 participants (just over half of all the adolescents involved in the disaster) were aged 11-17 (mean age 14.7). The adolescents were first assessed 5 months after the disaster, and were assessed again between 5.7 and 7.9 years later. A large proportion of these adolescents (51.5%) developed PTSD, in most cases within 6 months of the disaster. At follow-up only 34.2% of the adolescents who had developed PTSD (17.5% of the whole sample) continued to suffer from PTSD.

1.5.1.4 Sniper attacks and hostage takings

Nader, Pynoos, Fairbanks and Frederick (1990) completed a 14 month follow-up investigation of a group of children who had been exposed to varying degrees to a sniper attack at their school. At the initial assessment, approximately one month after the trauma, the 159 children, aged 5-3 years, were assessed using the semi-structured

interview format of the PTSD-RI. Post-traumatic stress symptoms were found to have significantly decreased at the follow-up assessment.

Vila, Porche, and Mouren-Simeoni (1999) conducted an extensive follow-up study of 21 children who were taken hostage in their classroom by a gunman. The children, aged 6-9 years, were not injured but subjected to a number of threats and insults by the gunman, who himself was eventually arrested without violence or resistance. The children were assessed using a semi-structured interview and the R-IES at 2 months, 4 months, 7 months, and 18 months after the incident. R-IES scores decreased a large amount between the 2 month and 7 month assessment points (effect size of d = 1.283; Cohen, 1988), and remained fairly constant at the 18 month follow-up. The study, however, was not naturalistic as the children received some debriefing after the trauma, and several received individual psychological interventions.

1.5.1.5 War

A number of studies have examined prospectively children's and adolescents' responses to war. As has been acknowledged in the above sub-section regarding natural disasters, the wide-ranging implications of war can exact a variety of hardships on young people besides the conflict itself. Nevertheless, children's and adolescents' gradual recovery following trauma has been documented.

Ahmad, Mohamed and Ameen (1998) conducted a follow-up investigation of Kurdish children's responses to the attack by the Iraqi army of Kurdish cities in Northern Iraq, and their families' resultant flight to safe areas. The cohort studied comprised 20 youths, aged 6-16 years at the time of the tragedy, who were selected at random from temporary camps on the Iraqi-Turkish border and assessed using a structured interview based on DSM-III-R criteria for PTSD. The cohort were assessed initially at 2 months after the tragedy, then again 4 months, 14 months, and 26 months. At the initial interview, a high level of PTSD symptomatology was detected, which had significantly fallen by the time of the 4 month follow-up. However, post-traumatic

stress increased between the second and third assessment points, remaining at this elevated level at the fourth and final assessment, 26 months after the tragedy. The authors were not sure whether to attribute this increased symptomatology to the natural history of PTSD or to the increasingly precarious political situation and wavering international support for the Kurds.

Stein, Comer, Gardner, and Kelleher (1999) assessed 147 Bosnian refugee children, aged 5-12 years, regarding their reactions to the conflict in Bosnia Hercegovina. The children had been living in refugee camps for anything up to a year. A follow-up assessment was conducted 8 months later. At follow-up PTSD symptomatology was not found to have improved or worsened in the cohort as a whole, but gender by time analysis revealed that boys, who initially had worse reactions, were improving more than girls over time.

Becker, Weine, Vojvoda, and McGlashan (1999) assessed 10 Bosnian adolescent refugees who had been resettled in the USA. At the time of the baseline assessment, conducted within a year of the adolescents' arrival in the USA, the group were aged 13-19 years (mean 16.1). The group were assessed 1 year after their baseline assessment. At each time point the adolescents completed the PTSD Symptoms Scale (Foa, Riggs, Dancu, & Rothbaum, 1993). While the small size of the sample prevented the proper use of statistical tests, inspection of self-report responses to this instrument indicated a considerable reduction in symptomatology by the time of the follow-up assessment. However, while none of the adolescents received an intervention directly addressing their PTSD symptoms, at least one received a behavioural intervention for non-trauma specific problems.

The responses to the conflict in the Gaza strip of a cohort of 234 children aged 6-11 years from Gaza were investigated by Thabet and Vostanis (2000). The children's PTSD reactions were initially assessed using the self-report form of the PTSD-RI within 6 months of cessation of hostilities in the region and again one year later. The

number of children reporting moderate to severe PTSD significantly decreased from 40.6% at initial assessment to 10.0% at one year follow-up.

In summary, a number of studies have charted the course of children and adolescents' PTSD reactions following a range of different traumas. The majority of these studies have found that PTSD levels recede in the months following a trauma, and that this improvement in mental health will persist. The two exceptions to this pattern, the studies by Ahmad, Mohamed, and Ameen (1998) and McFarlane (1987a), are likely to be attributable to ongoing stressors, such as dislocation and damage to property. However, all the studies outlined above have demonstrated that a significant minority of children and adolescents can continue to suffer from PTSD many months, even years, after a trauma. This finding highlights the need to differentiate between factors responsible for the onset and maintenance of PTSD symptomatology, as has been demonstrated in several recent studies of adults (see section 1.7 below regarding cognitive processes involved in the onset and maintenance of PTSD).

1.5.2 Acute Stress Disorder in children and adolescents

Acute Stress Disorder (ASD) was introduced in DSM-IV (American Psychiatric Association, 1994). This diagnosis was designed to describe stress disorders occurring in the period two days to four weeks after a trauma, before PTSD may be diagnosed (DSM-IV states that PTSD may not be diagnosed until four weeks post-trauma). This diagnosis also was designed to be used to identify individuals at high risk of going on to develop chronic PTSD. However, in trying to accomplish the latter function, it has been argued that this diagnosis was compromised by the inclusion of a dissociation symptoms criterion, the presence of which is essential for an individual to be diagnosed with ASD.

Like PTSD, the diagnosis of ASD requires the presence of one re-experiencing symptom, but only one avoidance symptom and one hyperarousal symptom, and three out of a possible five dissociation symptoms. The particular stress laid upon having

dissociation symptoms was the result of work implicating a role for dissociative processes in the aetiology of PTSD (Spiegel, Koopman, Cardeña, & Classen, 1996). The five dissociation symptoms listed in DSM-IV are "a subjective sense of numbing, detachment, or absence of emotional responsiveness", reduction in awareness of surroundings, de-realization, de-personalisation, and dissociative amnesia. These symptoms can contribute to an individual meeting the dissociation criterion if they occur either during a trauma or afterwards.

A number of studies have now examined adults' ASD responses to trauma, and how such responses relate to the development of chronic PTSD. Harvey and Bryant (1998) assessed adult RTA survivors who had been admitted to hospital within one month of their admission, and then again at 6 months post-trauma. While 78% of those adults diagnosed with ASD at the first assessment went on to be diagnosed with PTSD at 6 months, suggesting that the diagnosis of ASD is useful as an indicator of risk for PTSD, 60% of the adults diagnosed as having "sub-clinical" ASD (i.e., failing to meet one of the ASD diagnostic criteria, usually dissociation) went on to develop PTSD. Dissociative symptoms were identified as having high positive predictive power (i.e. if the symptom was present, PTSD was likely to be diagnosed at follow up) but only moderate to high negative predictive power (i.e. if the symptom was absent, there was still a possibility that PTSD would be diagnosed at follow up). The authors propose that the need to display 3 dissociative symptoms to meet the dissociation criterion for ASD is excessively stringent, and that greater emphasis be placed on arousal symptoms. A 2 year follow up study of the sample cohort (Harvey & Bryant, 2000) revealed that the relative value of ASD and sub-clinical ASD in predicting PTSD remained constant with time.

In a large population of adults survivors of violent assaults Brewin, Andrews, Rose and Kirk (1999) observed a similar pattern of results. ASD was found to be strongly predictive of PTSD at a 6 month follow up assessment, though a more efficient method of predicting later PTSD was to be found by simply counting the number of re-experiencing and arousal symptoms present in the acute phase. Indeed, the authors

conducted regression analyses that revealed that using this alternative method for assessing acute responses to traumatic stress made an equal and independent contribution to the prediction of PTSD. Thus both of these important studies suggest that there are multiple pathways involved in the development of chronic PTSD, and that not all of these pathways are reliant on dissociative experiences during or shortly after a traumatic event.

While acknowledging that dissociation during a traumatic event has been associated with the development of PTSD, both Bryant and Harvey (1997) and Marshall, Spitzer and Liebowitz (1999) are critical of using this association to "elevate [dissociation] to the status of a core symptom of a new disorder [Marshall et al. 1999]". Such is the doubt over the usefulness of this diagnosis, that there is considerable debate concerning whether to include ASD in DSM-V (Bryant, 2000). Any research regarding children's and adolescents' acute responses to trauma, and the applicability of ASD to children and adolescents, must therefore be aware that this construct is not a fixed entity whose status as a diagnosis is guaranteed.

With regards to the distinguishing feature of ASD, the dissociative symptoms, a body of research on child and adolescent dissociative states has been established. Several screening instruments have been developed to study and assess dissociation in children and adolescents (Evers-Szostak & Sanders, 1992; Reagor et al., 1992; Tyson, 1992, Putnam et al., 1993). Putnam and colleague's Child Dissociative Checklist (CDC) has proved to be especially valuable, possessing high internal reliability and test-retest reliability (Putnam, 1997). Dissociative states and processes examined by the CDC include amnesia and blackouts, forgetfulness for basic information, trance-like absence states, fluctuating personality states, fluctuating skills and abilities, poor sense of time, rapidly changing physical complaints, age-inappropriate sexual behaviour, auditory hallucinations, imaginary companions, and fugue episodes. The CDC and has been shown to discriminate between sexually abused and non-abused children, (Malinosky-Rummell & Hoier, 1991; Putnam et al., 1993, Wherry, Jolly, Feldman, Adam, & Manjanatha, 1994), and significantly correlate with item-

equivalent dissociation scales completed by children's therapists (Putnam & Peterson, 1994). Several of the items contained within the CDC are comparable to the dissociation symptoms of ASD, in particular the amnesia, de-personalisation and de-realisation symptoms. Similarly, the Adolescent Dissociative Experiences Scale (A-DES; Armstrong, Putnam, Carlson, Libero & Smith, 1997) has found high internal and test-retest reliability, and has been found to discriminate between psychiatric inpatients positively or negatively diagnosed as having dissociative disorders.

The finding that at least some children and adolescents dissociate would suggest that examining dissociation, and the ASD diagnosis, within the context of children's and adolescents' responses to trauma may offer insights into the aetiology of paediatric PTSD, as has been the case with adults. At present, very few studies have examined ASD in children and adolescents and the value of ASD, and its constituent symptoms and symptom clusters, in predicting persistent PTSD.

Winston, Kassam-Adams, Vivarelli-O'Nell, Ford, Newman, Baxt Stafford and Cnaan (2002) conducted telephone interviews assessing ASD with a large (n=97) cohort of 5-17 year old RTA survivors. While no follow up assessments of the cohort have yet been reported, the data presented thus far suggest that dissociative symptoms are quite common (with 78% of the cohort reporting at least 1 dissociative symptom), more common than the occurrence of re-experiencing, avoidance, and arousal symptoms.

Daviss, Racusin, Felischer, Mooney, Ford and McHugo (2000), and Daviss, Mooney, Racusin, Ford, Fleischer, and McHugo (2000) examined ASD and PTSD in a relatively small sample (n=52) of 7-17 year old children and adolescents who were injured and admitted overnight to hospital. The sample comprised mainly RTA survivors (about half), falls, winter sports accidents, accidental gunshots, and burns or explosions. Initial (ASD) assessments were derived from parent report of their child's symptomatology while they were still in hospital. Follow-up assessments were performed approximately one month after the child's or adolescent's admission, and

involved a structured interview (the Clinician Administered PTSD Scale, Child and Adolescent version; Nader, Kriegler, Blake, Pynoos, Newman, & Weathers, 1996) with the young person, and a parent report of their child's symptomatology as at the initial assessment. At the initial assessment 30.8% of the sample met criteria for ASD, while at 1 month follow-up 12.5% of the sample met criteria for PTSD. ASD, as assessed by the child's or adolescent's parent, was mildly correlated with PTSD symptomatology at follow up, but closer inspection of this finding revealed that it was only hyperarousal symptoms, and not dissociative, re-experiencing, or avoidance symptoms, at initial assessment that significantly predicted subsequent PTSD. However, this study has several significant flaws, including the short period between initial and follow-up assessments, and the lack of child self-report during the acute phase, which mean that a role for dissociation may not be excluded.

Similarly, Fein, Kassam-Adams, Gavin, Huang, Blanchard and Datner (2002) found that within a sample of adolescents and young adults ASD symptoms were significantly predictive of PTSD symptoms at a 5 month follow up. However, these authors failed to provide details of the relationships between the individual symptom clusters of ASD and PTSD at follow up.

ASD in children and adolescents has received little discussion (March, 2003), a consequence of the limited data available to guide commentators. Salmon and Bryant (2002) call for prospective studies conducted with children across developmental stages and various trauma populations to guide such a discussion. To a large extent the validity of the ASD diagnosis is not fully accepted; as the previous sub-section demonstrated, early post-traumatic stress symptoms are common, and are a good predictor of chronic PTSD. Dissociation, the distinctive feature of ASD, may or may not prove to be a significant component of a useful diagnosis. Nevertheless, the model of Ehlers and Clark (2000) would suggest that studying this complicated phenomenon is warranted in its own right, since "dissociation may impede the elaboration of [a] trauma memory and its integration into the autobiographical memory knowledge base [p. 330, Ehlers & Clark, 2000]". Hence, dissociation in

young people may prove to be an important factor in the onset of PTSD symptomatology.

1.6 Psychosocial factors identified as correlates of PTSD in children and adolescents

Several psychosocial factors have been identified as correlates or predictors of PTSD in children and adolescents. In this section key psychosocial factors found to pertain to PTSD will be outlined, and discussed in relation to the adult cognitive models of PTSD described above.

1.6.1 Appraisal of threat

The exposure-response relationship in children and adolescents exposed to trauma is widely accepted (Yule, Perrin, & Smith, 1999), most notably as a result of Pynoos et al.'s (1987) study that revealed a clear relationship between distance from a sniper who attacked a Californian school and later psychopathology. In addition to the objective threat of a trauma, more and more evidence suggests that the onset of PTSD in children and adolescents has been associated with subjective appraisal of the trauma as it occurs.

Among adolescents involved in the Jupiter sinking, Udwin, Boyle, Yule, Bolton, and O'Ryan (2000) found that subjective factors, including thinking they would not escape, thinking they might die, and having feelings of extreme fear, panic, anger and confusion, discriminated moderately well between children who developed PTSD and those who did not. In a study comprising a very large sample of children exposed to the genocide in Rwanda, Dyregrov, Gupta, Gjestad, and Mukanoheli (2000) found that the feeling of one's life being in danger was the most important predictor of the intrusive and avoidant symptoms that make up PTSD. More significantly, Ehlers, Mayou & Bryant (2003) found that subjective indices of accident severity were significantly associated with PTSD severity at 3 months and 6 months after an RTA,

while objective indices (type of injury, extent of injuries, and whether or not children were admitted to hospital) were not.

These findings emphasise the importance of speaking to children and adolescents directly about the thoughts and feelings they experienced during a trauma when later assessing the risk of post-traumatic psychopathology. In addition, these results suggest that the role of other appraisals in the aetiology of PTSD in children and adolescents exposed to trauma may warrant investigation.

1.6.2 The role of the family in mediating children's and adolescents' responses to trauma

One of the earliest studies into children's reactions to traumatic stress concluded that the family play a key role in the development of PTSD. McFarlane (1987b) looked at 183 families two, eight, and 26 months after they were exposed to a bush fire in Australia. A simple 11-item questionnaire was distributed at eight months post-trauma to investigate the effect of family functioning on child psychopathology. This measure was found to consist of three factors, which McFarlane termed irritable distress, involvement, and social anhedonia. In addition two questions assessed maternal over-protectiveness of her children. The parent and teacher questionnaires of Rutter and colleagues (Rutter et al., 1970; Rutter & Graham, 1967) were used to assess child psychopathology, and were modified slightly at the eight and 26 month stages to include items specific to PTSD.

Approximately one third of the children in the families assessed were found to 'have a continuing preoccupation with the disaster [McFarlane, 1987a; p.768]', a figure that is likely to be an underestimate due the large rate of false negatives associated with the Rutter scales. Separation from parents in the days immediately after the fire, continuing maternal preoccupation with the disaster, and changed family functioning were found to be more powerful determinants of posttraumatic symptomatology in the children than exposure to the fire, or the material losses sustained afterwards.

McFarlane offers several mechanisms to explain this finding. Firstly, a mother with PTSD may struggle to cope with her child's reactions. Secondly, children may be aware of their parents' reactions, independent of their own experience of the fire. Thirdly, a mother with PTSD may be more prone to being overprotective of her children, which has the effect of further sensitising her children to their trauma-related fears.

Green et al. (1991), in their study of children exposed to a dam collapse in the USA, similarly found that family functioning variables (irritable or depressed atmosphere) were predictive of PTSD symptomatology. It also was noted in this study that adolescents were more affected by the reactions of their parents, relative to younger siblings. The reason suggested for this finding was that older children were more likely to have to care for their younger siblings, and take on more parent-like, and hence more stressful, roles. Very young children were the most affected by parental symptomatology.

In a study of children's responses to living close to a nuclear waste reactor, Korol et al. (1999) found that children reported twice as many PTSD symptoms as their parents, though the frequency of symptoms of these groups were correlated. Exposure and parent functioning were found to be significant predictors of PTSD symptomatology, where exposure was reported as being the estimated distance from the plant, and parent functioning was assessed by the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983). It has to be noted however that the stressor was abstract, chronic in nature, and a critical point was never reached.

The largest study to date that has examined empirically the role of maternal psychopathology and functioning on child reactions to trauma, and vice-versa, was conducted on 339 nine- to 14-year-olds in Bosnia. Smith, Perrin, Yule, and Rabe-Hesketh (2001) distributed to children the War Trauma Questionnaire (WTQ; Macksoud, 1992), the Revised Impact of Event Scale (R-IES; Dyregrov & Yule; 1995), the Birleson Depression Self Rating Scale (DSRS; Birleson, 1981), the

Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), the Brief Grief Questionnaire (Nader, Pynoos, Fairbanks, Al-Ajeel, & Al-Asfour, 1993). The mothers of these children were given the RIES, the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979), the State Trait Anxiety Inventory (STAI; Spielberger, Gorusch, Luschene, Vagg, & Jacobs, 1983), and the General Health Questionnaire (GHQ-28; Goldberg & Hillier, 1979). Mothers also were asked to rate their children on the General Health and Behaviour Questionnaire (Goodman, 1994), while teachers' assessments of their pupils' psychopathology was measured using the Strengths and Needs Questionnaire (Goodman, 1994).

Using a cut-off score of 17 of the RIES as an indication of PTSD caseness, 58% of the children assessed were considered to have PTSD. Such high levels of PTSD were not accompanied by high levels of anxiety and depression, which were actually quite similar to those of a normal, non-traumatised, non-psychiatric group. Among the mothers of the assessed children, PTSD was very common, a number had depression (13%), anxiety was only slightly above normal levels, and caseness as assessed by the GHQ was also marginally higher than community studies.

The important findings of this study were that exposure to traumatic events (as assessed by the WTQ) was significantly associated with all children's outcome measures, and that maternal and child PTSD were associated. While exposure was the best predictor of the intrusion and avoidance symptoms of child PTSD, maternal mental health was the better predictor for children's self reported depression. The probable bidirectional association between child and maternal distress is considered by the authors of this study to be attributable to a vicious cycle process, where both mother and child avoid talking about the event for fear of upsetting each other. In this way each individual is being further encouraged to engage in avoidant coping, which maintains the disorder, a process that is supported by the finding of a large correlation between mothers' and children's avoidance scores. In addition, Smith et al. also found that maternal distress had a considerable distorting effect on their report of their children's distress, with mothers self-report scores highly correlated with their

reports of their children's symptoms. This is in contrast to the findings of Korol et al. (1999) who found that parents underreport their children's psychopathology; this difference is probably due to the far great intensity of traumatic stress in the families affected by the conflict in Bosnia. Nevertheless, this supports the usefulness, and indeed the necessity, of obtaining children's self-reports in the assessment of psychopathology.

Thirty months after a SCUD missile attack in Israel during the Gulf War, mother-child dyads were assessed for PTSD symptoms by Wolmer et al. (2000). The children, aged three- to five-years at the time of the attack, were six- to eight-year-olds at the time of assessment, and a large proportion of the 50 children were found to have post-traumatic symptoms at a similar level across age and gender. These clusters of symptoms were found to correlate more with maternal general pathological reaction than with specific maternal post-traumatic symptoms. In the six-year-olds (at time of follow-up) post-traumatic symptoms were related more to the mother's general symptoms (depression, anxiety, aggression etc.), than to her post-traumatic symptoms. However, the correlation between psychopathology of mothers and their seven-year-olds was non-significant, as was the correlation between maternal psychopathology and eight-year-olds post-traumatic symptomatology.

The failure to find any correlation for the older children is in contrast to the findings of Smith and his colleagues, and may be attributable to the different nature of the trauma experienced by each group, the small size of Wolmer et al.'s group, and the finding that the scales used to assess avoidance/numbing and arousal had only moderate internal reliability. Aside from methodological issues, the authors of the study suggest that development in personal autonomy accounts for the loss of correlation in reactions, a view that is also supported by the work of Green et al. (1991) following a dam collapse, where pre-school children were most affected by parental reaction.

The youngest children in this sample were found to form a close correlation with their mothers in terms of the level of their avoidance scores, a finding taken to be indicative of the close dyad that mother and child form, and the 'traumatic reminder' effect that such a dyad may have. The authors also highlight the ignorance regarding the direction of the effect observed in the correlations reported in such studies; do mothers enhance child symptomatology, or vice versa, or both?

Gurwitch et al. (1998), in a brief review of family functioning and its effects on children's reaction to traumatic stress, conclude that 'a family's reaction may buffer the negative effects of a trauma, providing a source of healing, or it can accentuate potential problems in a child's adjustment and coping [p.28]'. Certainly parental functioning, distress and psychopathology have an accentuating effect, and parental lack of stress reaction may act as a buffer, but a greater clarification of the relationship between child and parental reactions is needed. Research is needed to outline more accurately the role of both mother and child at each stage of the development of disorder. A number of issues warrant investigation.

Firstly, what is the role of parental reactions at the time of the trauma? In young children especially it has been hypothesised that maternal distress is responsible in part for signalling to the child that something is wrong, enhancing their sense of distress. Subjective distress at the time of the trauma is a factor associated with the onset of PTSD. In addition, children may look to their parents in an attempt to select the most appropriate response. The behaviours that the child chooses to engage in at the time of the event may have repercussions for later; a child who later perceives his or her peritraumatic reactions to be 'cowardly' or conversely, 'brave', may be at greater or less risk of developing PTSD; Dunmore, Clark, and Ehlers (1997; 1999) found that in adults exposed to sexual or physical violence, the appraisal of one's reactions was associated with both the onset and maintenance of PTSD. As discussed earlier, having a parent present at the time of a traumatic event may help to verbalise an event as it occurs, which in turn helps the child to understand the event, reduce their fear, and discourage the formation of traumatic memories.

Secondly, the strategies that the parents opt to use to cope with any re-experiencing symptoms may also be mimicked by their children. If a parent decides not to talk about the traumatic event, and avoids situations where they may come into contact with reminders of the trauma, a child may see avoidance as an appropriate strategy. The vicious cycle effect warned of by Smith et el. (2001) may then develop as a result, as trauma-related affect is avoided at all costs. Such strategies may have effects on both the onset and maintenance of PTSD. A parent's attempts to address the trauma, develop a great understanding of what happened, and experience unprocessed emotions, may signal to the child that such behaviours are acceptable and beneficial. At present there is very little evidence on this issue. Of great importance is the effect of more overt parental coping strategies (avoidance, confrontation, etc.) on children's covert and yet important coping strategies, such as the methods they adopt to deal with intrusive cognitions, and the child's attitudes towards emotional expression.

Thirdly, the higher order schemata that parents form (or maintain) after a traumatic event may well extend to children. Parental views of themselves, the world, and the likelihood of their future suffering may all be affected, with consequences for their children. Negative views of one's self and the world have been found in adults to be factors responsible for the maintenance of PTSD. Even if children do not assimilate such views into their own knowledge of the world, then parental depression and anxiety may lead to children enduring greater psychological stress in an indirect manner, e.g., as Green et al. (1991) suggest, through taking on greater roles within the family situation.

Many treatment packages for children with PTSD already include a degree of family-directed intervention (American Academy of Child and Adolescent Psychiatry, 1998; Pfefferbaum, 1997). The above evidence supports such an approach to treatment. Future research may be useful in directing how family interventions may be developed, and fit into a more holistic cognitive-behavioural treatment for children.

1.6.3 Pre-trauma psychopathology

Following an earthquake in the Los Angeles area, Asarnow et al. (1999) identified several variables that were associated with the number of PTSD symptoms reported in children one year after the disaster. Perceived stress and resource loss (e.g. the destruction caused to the child's home) and a pre-earthquake anxiety disorder were predictive of PTSD symptoms, as was the use of avoidant coping strategies (such as believing the event hasn't happened, not being around other people) and active cognitive coping (trying to see the positive side of the situation, preparing for the worst). The authors found that environmental attributes, specifically the family situation, were not effective in identifying which children would develop PTSD, as 'children within the same home experiencing similar objective events appear to perceive these events differently and show different reactions [p.1021]'. In addition, depression prior to the trauma was not found to be predictive of PTSD, but was predictive of the development of depression post-trauma.

Participants for Asarnow et al.'s study were drawn from a relatively small sample of clinic-referred families who had been involved in other studies performed prior to the earthquake. This resulted in an accurate assessment of pre-disaster psychopathology, but limited the numbers of children and adolescents (n=49) who had been assessed prior to the earthquake and were available after the earthquake. La Greca, Silverman and Wasserstein (1998) were able to follow up a slightly larger sample of children (n=74), drawn from an elementary school and not from a clinic, who had taken part in a study of children's anxiety 15 months prior to a hurricane disaster. Pre-disaster levels of anxiety, inattention, conduct problems, and school performance predicted post-traumatic stress 3 months after the earthquake, but at 7 months after the hurricane only pre-disaster anxiety predicted PTSD symptomatology.

1.6.4 Other psychopathology in children and adolescents following trauma

Several studies have observed that children and adolescents exposed to trauma are at risk of suffering psychopathology other than PTSD, and that such disorders are especially even more likely if the young person suffers from PTSD. In populations of children and adolescents exposed to trauma Pfefferbaum (1997) notes that a number of studies have reported comorbidity between PTSD and depression (Goenjian, et al., 1995; Green, 1985; Hubbard, Realmuto, Northwood, & Masten, 1995; Kinzie, Sack, Angell, Manson, & Rath, 1986; Kiser, Heston, Milsap, & Pruitt, 1991; Looff, Grimley, Kuiler, Martin, & Shunfield, 1995; Singer, Anglin, Song, & Lunghofer, 1995; Stoddard, Norman, & Murphy, 1989; Weine, Becker, McGlashan, Vojvoda, Hartman, & Robbins, 1995; Yehuda & McFarlane, 1995; Yule & Udwin, 1991), PTSD and substance abuse (Arroyo & Eth, 1985; Brent et al., 1995; Clark, Bukstein, Smith, Kaczynski, Mezzich, & Donovan, 1995; Looff et al., 1995; Sullivan & Evans, 1994), PTSD and other anxiety disorders (Brent et al., 1995; Clark et al., 1995; Goenjian et al., 1995; Kiser et al., 1991; Lonigan, Shannon, Taylor, Finch, & Sallec, 1994; Singer et al., 1995; Yule & Udwin, 1991), and PTSD and Attention-Deficit/Hyperactivity Disorder (Cuffe, McCullough, & Pumariega, 1994; Glod & Teicher, 1996).

Very little research has been aimed at investigating why this increase in psychopathology is observed in children and adolescents following trauma, especially those suffering from PTSD. Tiet et al. (1998) reported that an accumulation of adverse life events can lead to an increase in the risk of psychiatric disorder. This finding has spurred Pynoos, Steinberg, & Piacentini (1999) to suggest that the secondary stressors that often accompany trauma lead to an increase in PTSD and other adverse psychiatric reactions directly, and by limiting the effectiveness of support (e.g. from parents or school) that otherwise may have been available to children and adolescents. Further research is required to uncover the processes that give rise to other psychopathology, and how PTSD can aggravate such difficulties.

1.7 Cognitive and meta-cognitive processes involved in the maintenance of PTSD in children and adolescents

Among the most significant advances brought about in the adult cognitive models of PTSD outlined above is their account of the time course of the disorder. Accounting for the time course of PTSD is considered a necessary component for any model (Dalgleish, 1999). Such necessity seems to stem from the finding that, at least for severe trauma such as rape, post-traumatic symptomatology in the immediate aftermath of such an event may be common (Rothbaum, Foa, Riggs, Murdoch, & Walsh, 1992).

Dunmore, Ehlers, and Clark (1999, 2001) argued that factors responsible for the onset and maintenance of PTSD in adults are rarely distinguished in the literature, and that cognitive factors may play as significant a role in these aspects of the time course of PTSD as pre-traumatic and peri-traumatic experiences. Both Brewin et al. (1996) and Ehlers and Clark (2000) acknowledge that the onset of post-traumatic symptomatology may be strongly related to the quality of the memory laid down during the traumatic event, and argue that those individuals who suffer from more chronic PTSD are prevented in some way from processing such memories. This suggestion accounts for the finding that for many individuals the symptoms of PTSD are fleeting, whereas for others the disorder can last for many years.

In the rest of this section an examination, is offered of the kinds of cognitive processes that may be involved in the *maintenance* of PTSD in children and adolescents.

Appraisal, meta-cognitive, and information-processing aspects of cognition will be considered. First however, a caveat must be highlighted regarding the adoption of an onset-maintenance approach to PTSD in children and adolescents. While a growing body of research suggests that, as in adults, stress reactions in the immediate aftermath of a traumatic event may be quite common but diminish rapidly for most

individuals (American Academy of Child and Adolescent Psychiatry, 1998; Mirza, Bhadrinath, Goodyer, & Gilmour, 1998; Yule, Bolton, Udwin, Boyle, O'Ryan, & Nurrish, 2000), such findings should still be considered as tentative, especially in the case of young children who have been the subject of relatively few prospective studies.

1.7.1 Secondary Emotions

In the aftermath of a traumatic event, adults may develop what Brewin et al. (1996) term secondary emotions. According to these theorists, strong secondary emotions such as guilt and anger may interfere with the processing of traumatic memories by preventing a reduction in affect when traumatic memories are activated. Both anger and guilt (Goenjian, 1993; Gurwitch et al., 1998; Pynoos & Nader, 1988; Schwarz & Kowalski, 1991) are common reactions to trauma observed in children. To date both guilt (Pynoos et al., 1987) and anger (Vernberg, La Greca, Silverman, & Prinstein, 1996) have been shown to be associated with PTSD.

1.7.2 Thought control strategies

As discussed in detail above, the cardinal symptoms of PTSD are distressing intrusive thoughts, feelings, and images, through which the individual 're-experiences' the traumatic event. The way in which an individual responds to these reexperiencing phenomena can have significant repercussions; an important feature of Ehlers and Clark's (2000) model of PTSD is that maladaptive thought control strategies, such as rumination and thought suppression, paradoxically increase the frequency of the intrusions. Unlike other forms of avoidance that would appear to hinder the processing of traumatic memories, such as distraction, thought suppression would appear actually to exacerbate the reexperiencing symptoms.

Only two articles have evaluated the role of thought suppression in children with PTSD. In a study of 40 children exposed to MVAs, aged between eight and 17 years

old (mean age 13.6), Aaron, Zaglul, and Emery (1999) found that nearly one quarter of the exposed children developed PTSD (according to DSM-IV criteria). In a regression analysis of the assessed variables, only fear at the time of the traumatic event and thought suppression were found to be significant predictors of PTSD one month post-trauma, where greater fear and the greater endorsement of thought suppression were associated with worse symptoms.

Certain flaws are apparent in this study, most notably the use of a scale that includes intrusion items in addition to thought suppression items (the White Bear Suppression Inventory; Wegner & Zanakos, 1994), a small sample size, and that the children were assessed only at one month post-trauma. Nevertheless the study used both the key post-traumatic stress self-report measures available for use with children (the IES and the PTSD-RI), and included a suitable control group (non-MVA attendees at an accident and emergency department). Ehlers, Mayou, and Bryant (2003) also offer support for the role of thought suppression in their study of children involved in MVAs, where a single item assessing this strategy was found to be a significant predictor of PTSD at both three and six months post-trauma.

Dissuading a child from the use of thought suppression is a simple target for treatment. However further research is necessary to discover if thought suppression leads to an increase in the frequency of intrusive cognitions, as has been demonstrated in adults. Gaskell, Wells, and Calam (2001) demonstrated that the standard experimental thought suppression paradigm is workable with children aged seven to 11 years, while also finding that this thought control strategy was not responsible for an increase in intrusive thoughts.

Other thought control strategies, such as distraction, which may not exacerbate the occurrence of intrusive thoughts and memories but may still delay the processing of traumatic memories, are worthy of investigation. Stallard, Velleman, Langsford, and Baldwin (2001) found that in their sample of 97 children aged seven to 18 years who had been involved in MVAs, the use of distraction was associated with a diagnosis of

PTSD at six weeks after the accident, though was not predictive of PTSD at eight months post-trauma. Very little is known about the developmental course of thought control strategies with regards to PTSD or any other anxiety or depressive disorder. Unfortunately, the avoidance cluster of symptoms within the DSM-IV classification of PTSD includes one symptom for the avoidance of thoughts, feelings and conversations associated with a traumatic event; this crude grouping may mask important differences between adults and children in the use of what are quite distinguishable avoidant strategies. The findings of Aaron et al. (1999) and Ehlers et al. (2003) suggest that more detailed research regarding the varieties of cognitive avoidance is warranted.

1.7.3 The negative interpretation of intrusive symptoms

One factor only recently identified within the domain of adult PTSD is the interpretation of post-traumatic symptoms, in particular the intrusive symptoms (see Steil & Ehlers, 2000). For example, the occurrence of flashbacks may be seen by the individual as a sign that he or she is suffering from brain damage or "going mad". Emotional numbness may be interpreted as indicating future unhappiness, as a result of being unable to form a close relationship with anyone (for further examples, see Ehlers & Clark, 2000).

In addition to further enhancing a sense of current threat, such cognitions also promote use of maladaptive thought control strategies, such as thought suppression (see earlier). At present few studies in children have formally acknowledged the potential role of such interpretations. Terr (1983) noted that one of the Chowchilla bus kidnapping children had developed a fear of being afraid, a process that is related to the interpretation of symptoms. The only specific test of the role of these kinds of appraisals is that of Ehlers et al. (in press) where the appraisal of the self as going mad was associated with PTSD symptomatology at both three and six months post-trauma.

A concept that has been more readily applied to child psychopathology is that of anxiety sensitivity. Anxiety sensitivity is the tendency to catastrophise or over-interpret signals of anxiety. In adults, this construct has been closely associated with certain anxiety disorders (Taylor, Koch, & McNally, 1992). In children, the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson 1991) has been used to account for a significant proportion of variance on measures of children's fears and trait anxiety, which could not be explained by anxiety frequency. Increasingly evidence has suggested that this construct accounts for a unique proportion of variance in trait anxiety, and has potential implications for the assessment and treatment of anxiety (Silverman & Weems, 1999).

With regards to the psychopathology of PTSD in children, no study has examined specifically the role of anxiety sensitivity, though two studies have examined the role of anxiety sensitivity in a group of children with a number of anxiety disorders (Chorpita, Albano, & Barlow, 1996; Weems, Hammond-Laurence, Silverman, & Ginsburg, 1998). While there is some disagreement over the age at which anxiety sensitivity might influence general anxiety and fearfulness (where Silverman & Weems, 1999, argue persuasively in support of their finding that younger children are affected by their anxiety sensitivity), the emerging consensus is that by 11 to 12 years children possess the cognitive capacity to be concerned with abstract objects of fear, such as going crazy, losing control, or death. In each of these studies however, the number of children with PTSD was very small. This preliminary evidence that the construct of anxiety sensitivity is important in the development of anxiety disorders in children suggests that there is a pressing need to investigate meta-cognitive processes in paediatric PTSD.

1.7.4 Rumination

Ehlers and Clark (2000) describe how individuals involved in a traumatic event may ruminate over issues such as how the event could have been prevented, and how justice or revenge might be achieved. They also propose four ways in which

rumination may maintain PTSD: through strengthening maladaptive appraisals of the trauma, interfering with the processing of traumatic memories, increasing feelings of anxiety and hopelessness, and providing more internal cues to intrusive traumatic memories.

Within child and adolescent populations, very few studies have examined children and adolescents' use of rumination. Broderick (1998) assessed children aged between nine and 12 years for their responses to academic, family, and peer problem situations, and found that girls used rumination as a means of coping with stressors more than boys. Studies examining the role of rumination in child psychopathology are even scarcer, in particular with regard to child's reactions to trauma. Some studies have demonstrated that the attributions children and adolescents form concerning the causes of a traumatic event can influence the development of post-traumatic symptomatology (Joseph, Brewin, Yule, & Williams, 1993), though very little research has examined the repetitive kind of preoccupation identified by Ehlers and Clark (2000). One study has examined rumination and PTSD in children, that of Ehlers et al. (2003), who found that two items pertaining to ruminative styles (thinking about the trauma over and over, and wondering why the trauma happened to them) predicted the maintenance of PTSD symptoms.

Broderick's (1998) study makes apparent individual differences in the use of rumination among prepubescent children, and given the importance attached to rumination by recent studies of PTSD in adults (Clohessy & Ehlers, 1999; Dunmore et al., 1999; Ehlers et al., 1998), further research in children exposed to traumatic events is warranted. In particular such research may need to examine whether specific cognitions such as those identified by Ehlers et al. (2003) result from an individual's more global "behavioral-attentional style" (Nolen-Hoeksema, 1991).

1.7.5 "Current threat" and children's and adolescents' beliefs about self and the world

Following a traumatic event children suffering from PTSD are likely to have elevated levels of anxiety (Ellis, Stores, & Mayou, 1998; Lonigan, Shannon, Taylor, Finch, & Sallee, 1994; Vogel & Vernberg, 1993). Such anxiety is likely to be the result of a number of factors, but whatever the cause, ongoing anxiety is considered by most theorists to impair the successful processing of traumatic memories; accessing emotion-laden memories of a traumatic event is unlikely to produce clinical improvement if no extinction of fear can occur (Foa, Steketee, & Rothbaum, 1989).

Ehlers and Clark (2000) describe how adults with PTSD often possess a particular form of anxiety that they term "current threat" (see above). These authors consider this state to be strongly related to various beliefs that an individual holds regarding their present condition and their more global worldview. A discussion of the possible role of children and adolescents' views of their own symptomatology has been given above. With regards to their more global assumptions, a recent study by Bishop (2001) found that a traumatic event has little bearing on a child's "assumptive world" (Janoff-Bulman, 1989); indeed the absence of a relationship between the child's beliefs about the world and their levels of anxiety and depression is taken to suggest the fascinating possibility that "children may deal with traumatic events by subsequently rejecting assumptions about the world that threaten their sense of security [p. 404]".

Other evidence has demonstrated that appraisals relating more directly to a trauma are related to PTSD symptomatology. Joseph et al. (1993) found that adolescents giving more internal causal attributions for negative and uncontrollable events during the Jupiter disaster, as measured by analysing accounts of the trauma five months afterwards, scored higher on the self-report measures of depression and PTSD at both five months and one year after the disaster. No attributions of personal control were given by the adolescents assessed in this study, i.e. they did not think that they could have actually done anything to prevent or alter what was happening. The authors conclude therefore, that such internal, causal, and yet uncontrollable attributions generated a feeling of shame in the sample tested. However, the sample was limited

by the number of survivors that produced accounts that could be rated, and was potentially a biased sample, since participants were selected by solicitors on the grounds that they were considered 'at risk'. It is difficult therefore to generalise these findings to other traumatised groups of young people.

The role of emotions that result from internal and causal attributions, such as shame, in preventing recovery following a trauma is a key feature of the dual representation theory of PTSD (Brewin et al., 1996). A second, and yet not mutually exclusive view offered by Ehlers and Clark, is that considering oneself responsible for the trauma, helps to maintains a pervasive and persistent anxiety. The individual fears that it is something intrinsic about their personality or brain that means they were involved in the trauma or couldn't prevent certain aspects of it occurring, a belief which suggests that they continue to be at risk of suffering or being responsible for similar danger.

Terr (1981; 1983) notes that the young children involved in the Chowchilla bus kidnapping attributed the trauma to some event that preceded it, such as being angry with their mother, or stepping in a 'bad luck square'. Terr calls this phenomenon omen formation. The links between the omen and the trauma were based on a variety of pathways, such as the preceding event being causal or a warning of the impending tragedy, or a sign that the trauma could have been handled more easily if a different course of action had been taken. Terr (1981) asserts that such omens can become closely intermingled with posttraumatic psychopathology; indeed such thinking clearly reflects a child's attempts to explain an anomalous event, and be prepared for future trauma. The processes may often enhance a child's feeling of guilt, and anxiety upon future exposure to trauma-related stimuli. Terr offers an insightful explanation as to why children engage in such attributional strategies, if these strategies bring about such negative affect; it is more comforting to '[choose] personal responsibility and even guilt for the event over utter helplessness and randomness [p. 1547]'.

In addition to inflating a sense of guilt and anxiety, attempting to explain an event and make the future more predictable can lead to great pessimism about what will become

of one's life. A sense of foreshortened future is one of the symptoms listed in the DSM-IV avoidance cluster of symptoms. How this reflects an avoidant response to trauma is debatable. Perrin et al. (2000) also suggest that the adoption of such cognitions reflects a change in the young person's 'assumptive world'. If one is to view the formation of such cognitions as primarily an avoidant response, it is possible that not thinking about the future may be conceptualised as an avoidance of the distressing possibility that the traumatic event may recur. In this manner the traumatic event itself is avoided. Alternatively, by avoiding lifestyles such as marriage and childbearing, as some children who have been traumatised suggest that they will do (Schwarz & Kowalski, 1991), they are avoiding the emotional situations that they may find so provocative and painful. A further suggestion is provided by Schwarz, McNally, and Yeh (1998), who propose that an overgeneral memory, i.e. the inability to retrieve specific memories, which is observed in adults exposed to trauma, may be in part a cause of this distortion concerning the future. The inability to recall the past in detail may have consequences for how one envisions the future. Recently it has been reported that the overgeneral memory phenomena may occur in depressed adolescents as well as depressed adults (Park, Goodyer, & Teasdale, 2002), adding to the credence of this theory with regards to younger populations.

While certain efforts to understand a trauma may have adverse effects on mental health, it is also possible that in attempting to understand and accommodate a traumatic event into one's worldview children and adolescents may demonstrate enhanced maturity and depth of understanding of the world. Goenjian et al. (1999) compared adolescents living in a city in Armenia devastated by an earthquake, who had been 7-10 years old at the time of the earthquake, to adolescents in a city much less affected by the earthquake. The earthquake seems to have affected the adolescents in the devastated city in terms of their sense of personal morality and their worldview in both positive and negative ways. The children and adolescents in the devastated city possessed a more mature moral development. Typically, the adolescents of the more affected city reported being more nagged by their consciences, and being more understanding of the fact that things are not always

'black and white' when it comes to right and wrong. The children and adolescents advocated more community values and loyalty. The following months and years of rebuilding and recovery must have allowed for a great deal more hardship and reflection. The children and adolescents seem to have made some sense of their experiences, and the authors of the study attribute this to the tremendous guilt among the children and adolescents in the first few 6-18 months after the disaster (Goenjian, 1993), and the requirement of the children and adolescents to take on greater responsibilities in the aftermath of the disaster.

More negative consequences, however, were also observed, with children and adolescents scoring more highly on measures of psychopathological interference with conscience functioning. They were more likely to see themselves as bad people, and see the world as basically an evil place. The authors suggest that this was possibly as a result of the constant negative mood associated with suffering from PTSD and depression; the authors fail to suggest the alternate hypothesis, that such views may in part be responsible for the persistent nature of the adolescents' chronic psychopathology following the earthquake. A methodological flaw of this study was that assessments were carried out six years after the earthquake, and so the difference between the young people of each city cannot be attributed solely to the trauma of the earthquake itself. It is nevertheless clear from this study that a traumatic event and its aftermath can have a tremendous impact on a young person's view of their self and the world, and that such views are associated with chronic psychopathology.

In their practitioner review, Perrin and colleagues (2000) advocate the use of discussion and cognitive restructuring for self-blame, beliefs in the permanency of the traumatisation, and the overemphasis on the effects of the trauma on other aspects of life. In this sub-section evidence has been presented to support the view that children and adolescents do modify their schemata concerning the world following trauma, can generate powerful secondary emotions such as guilt and anger, and may blame themselves in part for what happened. Pynoos et al. (1999) point out that such changes in schemata may quickly become embedded in the individual, and operate

outside of conscious awareness. No studies have examined prospectively what kinds of cognitions predict the onset of PTSD or its persistence, or indeed cognitions that predict the depression and anxiety that are so often co-morbid with PTSD.

1.7.6 Worry

An early study into children's fears following a traumatic event (a lightning strike at a boy's football match) demonstrated that, not unsurprisingly, the children exposed to the tragedy were more likely than control groups to have fears and worries regarding a number of phenomena (Dollinger, O'Donnell, & Staley, 1984). These phenomena included lightning and thunderstorms, disasters, death and dying, as well as other events and situations that were not related to the event they were exposed to, such as animals and the supernatural. A similar increase in the fears was observed in child survivors of the Jupiter disaster (Yule, Udwin, & Murdoch, 1991). While such fears may result from amendments to a child's self-schema and external threat schemata (Kendall & Ingram, 1987; Kendall & Ronan, 1990), the intensity of such fears also may be aggravated by worrying.

Vasey (1993), following the work of Borkovec, Shadick, and Hopkins (1991), defined worry as "an anticipatory cognitive process involving repetitive thoughts and images that contain fear-producing content related to possible traumatic events and their potentially catastrophic implications [p.7]". Such a process is likely to play a significant role in enhancing specific fears following a traumatic event, in addition to maintaining a generally anxious mood. Vasey's consideration of childhood worry centres largely around the role of children's cognitive development, acknowledging that worry requires the ability both to anticipate future events as well as the related ability "to go beyond what is observable and consider what is merely possible [Vasey, 1993, p.9]". Before a child is seven to eight years of age, he or she is unlikely to be able to consider the future (Piaget & Inhelder, 1966), though at the slightly earlier age of five to six years children have been found to produce anticipatory thoughts of threat (Vasey, 1991).

For the child who already has experienced an extremely frightening event, it may be considerably easier to conceive of future threats, as demonstrated in the studies of Dollinger et al. (1984) and Yule et al. (1991). For children exposed to trauma, worry may be directed towards the prevention of the reoccurrence of an experienced event. In adult populations, it has been proposed that beliefs regarding the importance of worry, especially as a way of coping with future anticipated threats, play a key role in the maintenance of high levels of anxiety (Wells, 1995). The role of the meta-cognitive beliefs outlined by Wells (1995) have not yet received attention with regards to childhood anxiety disorders, yet Vasey (1993) has acknowledged that the role of children's beliefs concerning their own problem solving skills and cognitive states are related to uncontrollable worry. Future research directed at examining children's beliefs regarding worry could highlight how children think about the future following trauma and whether an endorsement of worry may maintain elevated levels of anxiety and contribute to the maintenance of PTSD.

1.7.7 Information processing approaches

Several experimental paradigms have been used to examine information-processing aspects of children's and adolescents' responses to trauma. In this section three paradigms (attentional biases, memory biases, and probability judgments) that have been used to examine information processing biases observed in children and adolescents suffering from PTSD will be considered.

1.7.7.1 Attentional biases

For some time it has been known that following a traumatic event adults suffering from PTSD demonstrate an attentional bias, as measured using the modified Stroop task, towards trauma-related cues than adults not suffering from PTSD (Cassiday, McNally, & Zeitlin, 1992; Foa, Feske, Murdock, Kozak, & McCarthy, 1991; Kaspi & McNally, 1991; McNally, Kaspi, Riemann & Zeitlin, 1990; Thrasher, Dalgleish &

Yule, 1994). In this task participants are required to name the colour of a word presented on a computer screen or on a board with a list of words. An attentional bias is thought to be present when the participant takes a longer period of time to name the colour of a word that relates to an individual's concerns relative to a neutral or non-word. In a review of the previous decade's work into the emotional Stroop task and psychopathology, Williams, Mathews and Macleod (1996) consider interference on the colour-naming task to be due to the presented word stimulus having a semantic value that relates to the individual's current concerns, danger schema or expertise. Thrasher and Dalgleish (1999) note that a variety of explanations have been proposed for why such a bias occurs, but no clear account exists as to why different methodologies for examining attentional biases (e.g. the dichotic listening task; Trandel & McNally, 1987) do not demonstrate the same bias so conclusively.

Three studies involving samples of children exposed to traumatic events have investigated the role of attentional biases in this age group. Moradi, Taghavi, Neshat-Doost, Yule, and Dalgleish (1999), in a study using the modified Stroop task, found that children aged 9-17 years who had been exposed to traumatic events such as MVAs or assaults, demonstrated an attentional bias towards trauma-related words (e.g., "injured", "blood"), relative to neutral words, and to children who had not been exposed to trauma. Unfortunately a sample of children who had been exposed to trauma but did not develop PTSD was not included in this study, and as the authors conclude, the children included in the study were old enough to have met all the significant cognitive developmental milestones. The same samples of children also performed the dot probe task (Dalgleish, Moradi, Taghavi, Neshat-Doost, & Yule, 2001). Children with PTSD selectively allocated attention towards socially threatening stimuli, and away from depression-related stimuli. No trauma-related stimuli were used in this study, however.

Ribchester (2001) has overcome some of the weaknesses of these studies of selective attention in children following trauma. Ribchester found that children suffering from PTSD who had been exposed to a MVA demonstrated greater response latencies

towards trauma-related words on a modified Stroop task, relative to other word categories and a sample of children also exposed to MVAs but not suffering from PTSD. In addition to using an appropriate control group, this study also found that the threat-specific attentional bias was eliminated following treatment with eye movement desensitisation and reprocessing (EMDR).

Although the findings from these studies are broadly consistent with others that have examined attentional biases in anxious children (Vasey et al., 1995, 1996), it has not been demonstrated that such biases play a role in the maintenance of PTSD in either children or adults. It remains to be established whether attentional bias is a discrete cognitive process involved in the aetiology and maintenance of PTSD, or an experimental index of PTSD symptoms (e.g., hypervigilance).

1.7.7.2 Probability judgements

Butler & Mathews (1983) found that adults with depression and anxiety estimated that negative events were more likely to happen, and were also were more likely to happen to themselves than other people, relative to normal controls. These findings were interpreted in terms of the "availability heuristic" (Tversky & Kahneman, 1974), which suggests "that estimates of the likelihood of a given event are not generated by a process of logical calculation but rather are a function of the ease with which instances or scenarios of similar events in memory can be brought to mind [Dalgleish, Moradi, Taghavi, Neshat-Doost, Yule, & Canterbury, 2000, p.982]'. Given that people with depression and anxiety are preoccupied with thoughts about negative situations, in the past or possibly in the future, according to this heuristic they are likely to give elevated probability estimates for such negative events.

In extending the same probability judgement paradigm to children with anxiety and depression, Dalgleish, Taghavi, Neshat-Doost, Moradi, Yule, and Canterbury (1997) found that, unlike with adults, children with these disorders did not estimate that negative events were any more likely to occur than control children who were not

suffering any emotional disorders. In addition, they did not estimate that negative events were more likely to happen to themselves than others, relative to controls. From this finding, Dalgleish and his colleagues hypothesised that the availability of negative event-related cognitions 'is elevated as a function of increased rumination about *hypothetical* negative incidents [Dalgleish et al., 2000, p.982]'. It is possible that children do not engage in rumination about future hypothetical events, and so are considerably less likely to give elevated probability estimates for such events.

Dalgleish et al. (2000) conducted a study of children who actually had experienced a very negative event, and then proceeded to develop PTSD, in order to test this hypothesis. As Dalgleish and colleagues found a similar pattern of results to the anxious and depressed children of their earlier study, it can be concluded that the lack of hypothetical rumination explanation for the failure to observe an elevated probability judgement is false. The alternative explanation offered is that children are capable of inhibiting information related to a negative event, thereby decreasing the availability of negative event information when estimating a probability judgement.

There are two reasons to reject this inhibition theory. Firstly, as the authors themselves suggest, if the children were inhibiting information related to the trauma, then they would have given lower estimates of negative events occurring, relative to controls, which was not the case. Secondly, it is not plausible that children would use a sophisticated thought control strategy, which presumably assists in reducing their subjective distress, while adults do not. Dalgleish and colleagues recognise this explanation, and suggest that in the case of adults, availability effects must outstrip inhibition effects. This may be likely given that adults, with their greater cognitive capacity, are more able to devise more detailed negative future outcomes and ruminate about them.

Clearly the presence of inhibitory mechanisms in children has important implications for an understanding of the aetiology and possible treatment routes for PTSD in this population. Rumination in adults has been found to be associated with more negative

outcome following trauma (Ehlers et al., 1998). If children have sufficient inhibitory mechanisms available to prevent rumination about the impact of the traumatic event to which they have been exposed, then inhibition may be protective. A more negative effect of inhibition may be that emotional processing of traumatic memories is prevented. There is a tremendous need for further studies of cognitive inhibitory processes in children, with and without anxiety disorders, before this potentially highly important aspect of child psychopathology enters into the mainstream aetiological models.

1.7.7.3 Memory biases

In addition to biases of probability estimation, individuals with emotional disorders have been found to have explicit memory biases in favour of recalling negative information, in particular if that information relates to the individual's concerns (see Williams, Watts, McLeod, & Mathews, 1997, for review). Such biases may function as a maintaining factor in the emotional disorders by selecting information that reinforces the cognitions that are distressing.

Following studies that supported the existence of memory biases in children with depression (Neshat-Doost, Taghavi, Moradi, Yule, & Dalgleish, 1998) and anxiety (Daleiden, 1998), Moradi, Taghavi, Neshat-Doost, Yule, and Dalgleish (2000) repeated a basic free recall and recognition procedure for testing memory bias in a group of children and adolescents with PTSD. In addition to showing poorer overall performance on the tasks, the PTSD participants showed a bias in recalling negative words, relative to neutral and positive words. However, the participants with PTSD did not have a bias specifically towards negative words associated with trauma, relative to depression-related negative words and general threat-related words. These data were taken to indicate that cognitive models of emotion developed in adults might be applied, in part, to children. Unlike children with depression, the memory bias in this group did not increase with age, suggesting that the 'information processing biases associated with anxiety may be a function of the basic emotional

state and therefore be present at full strength from the developmental onset of the emotion [p. 531, Moradi et al., 2000]'.

The cognitive processes of attentional bias, probability estimation, and memory bias and their role in child psychopathology still require a great deal of research, but some points can be made from the work already conducted in relation to PTSD in children and adolescents. Children and adolescents with PTSD do show worse overall cognitive functioning, both in the information processing tasks described above, and more general mnemonic functioning (Moradi, Neshat-Doost, Taghavi, Yule, & Dalgleish, 1999). This finding validates the considerable clinical evidence suggesting that children with PTSD may, like adults, present with the DSM-IV symptom of difficulty concentrating. The existence of mnemonic and attentional biases also suggest a continuity between child PTSD and adult PTSD in terms of underlying processes associated with the disorder. At present no studies in adults have examined empirically how such processes may maintain the disorder, though several theories have been suggested.

1.8 Conclusions and rationale for the current investigation

1.8.1 Summary and conclusions

It has not been the aim of this introduction to outline the effects that trauma has on a child's development and distal psychopathology (see Pynoos et al., 1999, for such an account). This is not to say that trauma and PTSD do not have long-term developmental consequences for children, in terms of both psychopathology, and more general functioning such as school performance. The work of Bolton, O'Ryan, Udwin, Boyle, and Yule (2000) in the follow-up of children involved in the *Jupiter* disaster demonstrated that children are at a greater risk in the aftermath of a traumatic event of developing a range of anxiety and affective disorders, especially if they have PTSD. Rather, it has been the purpose of this introduction to stress the need for a more detailed understanding of the precise mechanisms that govern the incidence and

course of post-traumatic stress reactions, as well as how other psychopathology can result following a traumatic event.

In particular, evidence has been presented that suggests that adopting three distinct components of the cognitive models of adult PTSD devised by Brewin et al. (1996) and Ehlers and Clark (2000) would offer insights into the understanding of children's and adolescents' responses to trauma. These components are i) distinguishing between onset and maintenance factors in the aetiology of PTSD, ii) the critical role of the nature of trauma memories in the onset and maintenance of the disorder, and iii) the role of negative appraisals and maladaptive coping in maintaining the disorder. It is proposed that other factors found to be associated with child and adolescent PTSD may be investigated within such a framework, e.g. the role of the family (Smith, et al. 2001), the role of pre-traumatic psychological disorders (Asarnow et al., 1999; La Greca, et al., 1998), and the increased prevalence of emotional disorders in children and adolescents exposed to trauma.

An examination of the developmental context to these critical theoretical issues has been initiated here, yet, as has been shown, considerably more research is required. The case for applying elements of adult approaches to psychopathology to the understanding of childhood emotional disorder has already been made, e.g., the information processing perspective on anxiety (Daleiden & Vasey, 1997). However, there exists in this application of adult theory the danger that "the more the research is about psychopathology, the less it is about development [Steinberg, 2002, p.127]". Adopting the framework outlined here does not preclude developmental considerations when understanding children's reactions to traumatic events. Indeed, such a framework allows investigation into developmental influences on the specific processes that contribute to the onset and maintenance of PTSD.

Understanding the aetiology of child and adolescent PTSD in greater detail will have tremendous implications for psychological interventions for youth following trauma. While considered the "first-line" approach to treatment, the "active ingredients" of

cognitive behaviour treatment for PTSD in children and adolescents have yet to be established (Cohen, Berliner, & March, 2000). Exposure treatments have been shown to be effective in child as well as adult populations (Saigh, Yule, & Inamdar, 1996), but the success of this treatment could be attributable to different therapeutic processes. Exposure treatment may allow a reduction in the negative affect and arousal incorporated in traumatic memories, modify the structure and form of the traumatic memory such that the memories are less likely to be triggered by external sensory stimuli, or both of these processes. The role of cognitive elements of cognitive behaviour therapy similarly needs clarification, and it is suggested that cognitive interventions will benefit from incorporating an understanding of children's cognitive avoidant and meta-cognitive processes in the aftermath of trauma. The framework presented here for understanding elements of children's and adolescents' reactions to trauma may inform how cognitive behavioural treatments might be improved and tailored to a child's development.

1.8.2 Rationale for the current investigation

The central aim of this investigation is to understand the role of cognitive processes, described above, in the onset and maintenance of PTSD in children and adolescents. In particular, the framework outlined in the previous sub-section advocated examining several critical issues regarding child and adolescent PTSD.

First, an examination of the role of the nature of trauma memory is strongly warranted. To this end it is considered that a measure of the nature of memories of a trauma should be examined soon after the event, and the role of this factor in causing post-traumatic stress in both the acute and chronic periods should be quantified.

Second, the role of cognitive appraisals in determining PTSD should be examined. Specifically, the appraisals investigated should be those a child or adolescent had during a trauma, those relating to the world and the self following a trauma, and those relating their own PTSD symptomatology after a trauma.

Third, pathways to avoidance (in both cognitive and behavioural forms) should be elucidated. That is, since avoidance has been regularly demonstrated to be associated with chronic PTSD, there is a pressing need to understand the attitudes and responses that are likely to result in children and adolescents adopting this activity in the aftermath of a trauma. The importance attached to forms of cognitive avoidance by both Brewin et al. (1996) and Ehlers and Clark (2000) suggests that research may be usefully directed towards understanding to what extent children use these maladaptive thought control strategies.

Fourth, the role of ruminative and worrying coping styles, identified as being correlates of both post-traumatic stress and other psychopathology in adults, in maintaining PTSD needs to be assessed. In particular, the role of worry in persistent hyperarousal and anxiety, and the role of rumination in precipitating maladaptive appraisal and maintaining post-traumatic depression, need evaluation.

Fifth, the ability of ASD to predict chronic PTSD in children and adolescents requires investigation. In examining this diagnosis the relationship between dissociative symptoms (both during and after a trauma) and PTSD, in particular the effect of dissociation during a trauma on laying down fragmented, sensory-laden memories, may be examined.

Sixth, the role of parents and the family, already demonstrated to be important in the development of PTSD in children and adolescents (Smith, Perrin, Yule, & Rabe-Hesketh, 2001), deserves further investigation. In the context of the framework for considering child and adolescent PTSD outlined above, a child's family may be playing a role in moderating PTSD at a number of points: by enabling a child to verbalize a traumatic event as it occurs, enabling the verbalization and emotional processing of a traumatic event in its aftermath, and influencing a child's appraisals and coping styles after a traumatic event. Examining parental influence on these

stages may offer insights into psychopathological responses to trauma in children and adolescents.

Seventh, pathways to other post-traumatic psychopathology need to be delineated. As has been demonstrated in adults exposed to trauma (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999), a child's appraisals following a trauma may be associated with depression and anxiety, as well as PTSD symptomatology.

Eighth, the role of pre-traumatic psychological disorders in increasing the risk of PTSD (Asarnow et al., 1999; La Greca, et al., 1998) may be better understood. Pre-existing elevated arousal may lead to a child laying down more emotion-laden memories and be related to the onset of PTSD, while the presence of maladaptive cognitive and meta-cognitive styles may play a role in the maintenance of posttraumatic symptomatology. For example, rumination in the aftermath of a trauma may be related to a pre-existing belief concerning the merits of ruminating as a method of problem-solving or avoiding negative affect. The suppression of thoughts relating to the trauma may relate to the pre-existing use of this strategy to control unpleasant thoughts or memories. The negative appraisal of post-traumatic symptomatology may be related to a pre-existing and more general negative appraisal of bodily sensations and anxiety symptoms. The view that worry is a positive way of coping may lead to the generation of more post-traumatic arousal and maladaptive beliefs (e.g. "the world is an unfair place", "I am a weak person").

In order to address these key questions, two studies were designed. Given the limited amount of research conducted in this area, and the methodological and ethical problems associated with recruiting younger children, it was decided to conduct each study using older child and adolescent participants, aged 10 to 17. The first study designed for this investigation involved surveying the prevalence of intrusive memories and other post-traumatic symptomatology in non-clinic referred samples of children and adolescents. This study required that children and adolescents, recruited from secondary schools, completed questionnaires concerning a recent frightening

experience. These questionnaires assessed what kind of event they had experienced, the emotions they felt during the event, the quality of their memories of the frightening event, the strategies they used to cope with intrusive memories of the event, post-traumatic and depressive symptomatology, and how they appraised the effect of the trauma and any post-traumatic stress symptoms.

While lacking the ability of a prospective study to delineate the role of onset and maintenance processes, the use of a cross-sectional study design would allow for an exploratory investigation of the relationships between memory quality, the frequency and quality of intrusive memories, other PTSD symptoms, post-traumatic appraisals, and the coping strategies adopted to cope with such symptoms. It was thought that conducting this study in a non-clinical population would be useful as it would determine whether the processes hypothesised to be involved in the onset and maintenance of PTSD in children and adolescents exposed to traumatic events, would be qualitatively different from the processes observed in youth exposed to less severe events. In addition, distributing the questionnaires used in Study 2, a prospective study, to large samples of non-clinical children will be useful in validating (in terms of their component structure and internal reliability) the novel measures designed for this investigation.

The second and more important study comprised a prospective investigation of children's and adolescents' psychological responses to either an assault or an RTA. These traumatic events were chosen as i) it was considered likely that a child or adolescent undergoing such events would meet criterion A (exposure to a traumatic event) of the DSM-IV PTSD criteria, ii) such events are commonly experienced by children and adolescents, especially in urban areas, and have been found to be a common cause of PTSD, and iii) a representative sample of children and adolescents exposed to such events could be identified and recruited at hospital accident and emergency departments.

A prospective study affords the opportunity to understand the role of a number of cognitive processes in the aetiology of child and adolescent PTSD. The cognitive processes chosen to be investigated included:

- The formation of sensory-based and fragmented memories of the trauma,
- negative beliefs about self and the world,
- self-blame,
- thought control strategies,
- rumination as a response to any (not necessarily trauma-related) mental distress,
- endorsement of worry as a positive strategy,
- the negative appraisal of anxious and post-traumatic symptomatology,
- negative attitudes towards emotional expression,
- thought suppression of intrusive traumatic memories,
- distraction from intrusive traumatic memories, and
- rumination about the traumatic event and its consequences.

It was also considered that the mediating effect of age and parental influence on these variables could be assessed, in order to understand the developmental limitations on the application of cognitive models of PTSD to children and adolescents, and the extent to which parents shape their child's ability to cope with a traumatic event. Given the exploratory nature of this investigation, it was considered appropriate to focus on examining these processes in older children and adolescents (10-16 year olds), who would be more likely to have reached the level of cognitive development necessary to undertake the processes and appraisals outlined above. A prospective study would also allow for investigation of the power of the ASD to predict later PTSD.

The two studies designed for this investigation would be novel in a number of ways. To the investigator's knowledge, no studies have yet examined post-traumatic stress symptoms in a non-clinical child and adolescent population, or in a sample of children and adolescents exposed to an assault. The prospective study designed for

this investigation would be only the third study to investigate the kinds of cognitive processes postulated by Brewin et al. (1996) and Ehlers and Clark (2000), and the first to examine the ability of the ASD diagnosis to predict chronic PTSD in this age group. This prospective study would use more thoroughly devised measures than previous studies (Ehlers et al., 2003, Stallard, 2003), and would attempt to relate cognitive processes involved in pre-trauma psychopathology to processes directly involved the aetiology of PTSD.

1.8.3 Hypotheses for the investigation

As stated above, the central aim of this investigation was to understand the role of cognitive processes, described in the introduction, in the onset and maintenance of PTSD in children and adolescents. Having conducted a review of the literature concerning the aetiology of PTSD in children and adolescents, and then highlighted several key issues that require investigation, a number of specific hypotheses were made concerning this investigation, listed here.

Hypothesis 1: In Study 2, PTSD symptomatology across the sample assessed will decrease as a function of time;

Hypothesis 2: Subjective indices of trauma or frightening event severity will account for unique variance in PTSD scores over and above objective indices of trauma severity and other demographic variables, and in Study 2 will be particularly associated with the onset of PTSD (i.e. PTSD as assessed soon after the assault or RTA);

Hypothesis 3: Sensory-based and fragmented memories will be correlated with post-traumatic stress symptoms following a trauma or frightening event. In both Study 1 and Study 2 memory quality will account for a proportion of unique variance in PTSD scores, over and above demographic variables and peri-traumatic distress. Within Study 2, memory quality will be strongly correlated with the onset of PTSD,

but to a lesser degree with the maintenance of PTSD (i.e. PTSD as assessed several months post-trauma);

Hypothesis 4: In Study 2, peri-traumatic dissociation will be correlated with the onset of PTSD symptoms, but to a much lesser extent be predictive of chronic PTSD. With regards to the ASD diagnosis, the dissociation criterion will not significantly enhance the ability of the diagnosis to predict chronic PTSD;

Hypothesis 5: The various cognitive processes outlined in the previous sub-section will be correlated with PTSD symptomatology in Study 1, a cross-sectional study. In Study 2, a prospective study, such processes will predict chronic PTSD (i.e. they would be involved in the maintenance of PTSD), over and above the effects of the variables hypothesised to be involved in the onset of PTSD (i.e. peri-traumatic distress and memory quality);

Hypothesis 6: Maladaptive appraisals concerning the trauma or frightening event will be related to the use of maladaptive coping strategies, in both Study 1 and Study 2;

Hypothesis 7: Family psychopathology and cognitive processes, assessed in Study 2, will be related to child PTSD, particularly in the maintenance of the disorder;

Hypothesis 8: Where prior psychopathology was related to the onset and maintenance of PTSD in participants of Study 2, this relationship will be attributable at least in part to the role of maladaptive cognitive styles and coping strategies that pre-existed the trauma;

Hypothesis 9: The cognitive processes involved in causing PTSD symptoms in participants of Study 1 and Study 2, in particular negative appraisals, will also play a large role in causing depressive responses to the trauma or frightening event.

Note. A version of this introduction was published in a peer-reviewed journal. Please see Appendix C for a copy of this article.

Chapter 2: Methodology for Study 1: A naturalistic study of intrusive cognitions, post-traumatic psychopathology, and coping in a non-clinical sample of children and adolescents following self-reported upsetting events.

In chapters 2 and 3 an account will be given of the methodologies used in Studies 1 and 2, respectively. In this chapter an account of the methodology used for Study 1, the cross-sectional study, will be given.

2.1 Design

This study involved gathering cross-sectional data from a non-clinical sample of children and adolescents, with the aim of estimating the prevalence of intrusive memories (the cardinal symptom of PTSD) within non-clinical populations, and exploring the relationships between memory quality, the frequency and quality of intrusive memories, other PTSD symptoms, post-traumatic appraisals, and the coping strategies adopted to cope with such symptoms. In addition, data were gathered on measures of cognitive and coping styles, in order to derive fully the psychometric properties of the measures used in Study 2.

2.2 Ethical permission

Ethical permission for the study was successfully sought from the Institute of Psychiatry Research Ethics Committee (Study No. 133/01).

2.3 Participant population

The participant population was drawn from two secondary schools in England. The first, School A, is a mixed-sex comprehensive school in a small town in the West of England, where 3.7% (in 2000) of pupils qualify for free school meals. The second, School B, is a mixed-sex comprehensive school in an outlying district of Nottingham, where 11.2% (in 1996) of pupils qualify for free school meals. The proportion of

pupils that qualify free school meals is the standard indicator of the social backgrounds of pupils at a school; the average within the UK is 16%, suggesting that both schools, in particular School A, are of above-average social background.

Children and adolescents from years 7 (11-12 year olds), 9 (13-14 year olds), 11 (15-16 year olds) and the sixth form (16-18 year olds) were invited to participate in the study.

2.4 Procedure

The consent procedures stipulated by the Research Ethics Committee of the Institute of Psychiatry required that the opt-in informed consent of parents and the informed consent of their children be required for the pupils to participate in the study (except for pupils aged 16 and over, for whom only the pupil's consent was required). Initially therefore, children at School A took letters home to their parents informing them about the study, and asking for their permission for their child to participate in the study (see Appendix A for copies of all letters, information sheets and questionnaire batteries used in Study 1). Parents would have to return a reply slip if they consented to their child participating. The pupils themselves were given a forewarning of what the study would involve, and on the day of the study received information sheets detailing why the study was being conducted and what participating in the study would involve. Letters to parents and information sheets for children stressed that participating in the study was voluntary and any information received would be treated as confidential, except in instances where it was thought that the child was at risk of further harm.

A very low participation rate at School A using this opt-in consent procedure necessitated an amendment to the recruitment procedures. This amendment, ratified by the Research Ethics Committee of the Institute of Psychiatry, allowed the use of an opt-out consent procedure. This involved writing directly to parents' homes (as opposed to sending letters home via pupils) and informing them about the study.

Parents were informed that unless they returned the reply slip, it would be assumed that they consented to their child participating in the study, as long as their child also consented to participating. Using this procedure at School A and at School B in the following academic year there was a far higher rate of participation (see following sub-section).

Teachers presented a consent form and 12-page questionnaire battery to children within their class and went over the details presented within the information sheet and any concerns that they might have. The teacher then gave instructions as to how to complete the questionnaire battery. Again it was stressed that participation in the study was voluntary and that any information received would be treated confidentially, unless any child was thought to be in any danger. Children were assured that they could drop out at anytime they choose, without any consequences at school or at any hospital. It was also stressed that each child's own personal responses were needed, and that there were no right or wrong answers to the questionnaire items.

Children completed the battery with both the teacher present and the investigator available should any child become upset and need help. Children took between 15 and 30 minutes to complete the questionnaire battery. No child became upset while completing the questionnaire. A number of children stated that they were unable to think of a frightening event that had happened to them in the previous two months (the opening question of the questionnaire battery). Children were encouraged by the investigator to take more time to think about events that they had experienced recently and to report any frightening event, however trivial, e.g. watching a scary film or nearly being in an accident. If children were still unable to recall a frightening event they were asked to complete the sections of the questionnaire battery that weren't related to a specific event.

2.5 The questionnaire battery

The questionnaire battery completed by children participating in Study 2 centred on the disclosure of a frightening event that the child had experienced in the previous two months. The remaining sections of the battery were aimed at investigating the emotions elicited by the frightening event, the frequency and quality of memories and intrusive memories of the event, psychopathology following the event, general strategies for coping with intrusive cognitions, and appraisals of the event and its sequelae.

Each component of the questionnaire battery is described in the following sub-sections.

2.5.1 Section 1: A brief description of a recent frightening event

Children were asked to briefly describe a frightening event they had experienced in the two months prior to participating in the study. A brief description was requested so as to limit the degree of distress elicited by participating in the study. A period of two months was chosen as it thought that the frightening event had to be sufficiently recent to be memorable, but not too recent so as to limit the number of frightening events that they children might recall.

2.5.2 Section 2: Affect during the frightening event

Children were asked to rate their affect during the frightening event on Likert scales (with possible responses of 1-10, where a greater number indicated a stronger emotion). The five emotions assessed were "scared", "angry", "sad", "ashamed", and "helpless".

2.5.3 Section 3: Frequency of intrusive memories of the frightening event

Children were asked to rate how frequently they experienced intrusive memories of the frightening event. These memories were described as "popping" into mind and as

being unwanted. Possible responses to this question were "not at all or only one time", "once a week or less/once in a while", "2 to 4 times a week/half the time", or "5 or more times a week/almost always".

2.5.4 Section 4: Affect during intrusive memories

Children rated their affect when they experienced intrusive memories of the frightening event. Seven different emotions ("scared", "angry", "sad", "crazy", "confused", "ashamed", and "helpless") were rated by each on a 1-10 Likert scale (i.e. the greater the number, the greater the emotion).

2.5.5 Section 5: Memory Modality Questionnaire (MMQ)

The MMQ was devised for this investigation as a measure of the quality of the memories that participants have of the event to which they were exposed. This 14 item self-report questionnaire was developed with the purpose of testing the theory of Brewin et al. (1996). These authors propose that 'the sensory (visual, auditory, olfactory, etc.), physiological, and motor aspects of the traumatic experience are represented in situationally accessible knowledge in the form of analogical codes that enable the original experience to be recreated [p.676-677]'. Thus, the characteristic re-experiencing and hyperarousal symptoms of PTSD result from the nature of the memories of the traumatic event.

The MMQ contains items pertaining to the visual quality, verbal encoding, temporal context (the extent to which the event feels like an event in the past or as if it is occurring now), and non-visual sensory (e.g. olfactory, auditory etc) quality of the memories children have of the traumatic event. Children completing the questionnaire were asked to respond in one of four different ways: "don't agree at all", "don't agree very much", "agree a bit", or "completely agree".

2.5.6 Section 6: Difficulty in inhibiting intrusive memories

Children rated the difficulty with which they inhibited intrusive memories from their mind. Children indicated their responses using a Likert scale of 1-10 (where a greater score indicated greater difficulty in inhibiting the intrusive memory).

2.5.7 Section 7: Strategies for coping with frightening event-related intrusive memories

Children rated the extent to which they used the strategies of thought suppression ("pushing the memory out of mind") and distraction ("I try hard to think about something else") to cope with their intrusive memories of the frightening event. Children were able to respond "I don't agree at all", "I don't agree a bit", "I agree a bit", and "I agree completely" to these two items.

2.5.8 Section 8: Strategies for coping with intrusive memories and thoughts

The original Thought Control Questionnaire (TCQ) was a 30-item instrument for measuring strategies for coping with unpleasant and unwanted thoughts in adults (Wells & Davies, 1994). When validating the instrument it was found to have a five-factor structure. The factors were labelled distraction, social control, worry, punishment and reappraisal. The factors were found to possess acceptable internal reliability (with Cronbach's alpha coefficients of .72, .79, .71, .64, and .67 respectively). The TCQ also has been found to be useful in identifying the strategies used to control the re-experiencing symptoms of PTSD (Reynolds & Wells, 1999).

A child version of the TCQ (hereafter referred to as the cTCQ) was created for the purposes of this study. Participants could respond in one of four ways to each item ("never", "sometimes", "often", or "almost always").

2.5.9 Section 9: Revised Impact of Event Scale; child version

The RIES-C is a 13 item child's version of the Revised Impact of Event Scale (RIES; Horowitz, Wilner, & Alvarez, 1979), a self-report measure of post-traumatic symptomatology used with adults. The RIES-C was adapted from the RIES following concerns that certain items belonging to the latter were incomprehensible to children (Dyregrov & Yule, 1995).

The RIES-C contains items pertaining to the three core symptom clusters that form PTSD, re-experiencing, avoidance and arousal. Children are asked to respond to the presented items by indicating how true these were for them over the past week. Children may tick one of four responses ("not at all", "rarely", "sometimes", or "often", scored 0, 1, 3, and 5 respectively). This scale has been widely used in other studies of children's responses to traumatic events (e.g. Papageorgiou, Frangou-Garunovic, Iordanidou, Yule, Smith, & Vostanis, 1999; Smith, Perrin, Yule, & Rabe-Hesketh, 2001; Vila, Porche, & Mouren-Simeoni, 1999) and has been considered to be a useful continuous measure of children's post-traumatic symptomatology.

2.5.10 Section 10: Birleson Depression Self-Rating Scale

The Birleson Depression Self-Rating Scale (BDSRS; Birleson, 1981) is a measure of childhood depression, developed primarily in an attempt to assess whether this diagnosis is appropriate within this age group. Basing his self report scale on various sets of criteria devised for depression in adults, Birleson initially distributed a 37 item questionnaire to 17 children thought to be suffering from depression, 17 control children from the same clinic but not suffering from depression, 20 children from a residential school for maladjusted children, and 19 children from a primary school. The children could respond to each item by indicating whether or not the statement referred to them using one of three categories ("no/never", "sometimes", or "most of the time").

Eighteen of the original 37 items were found to significantly discriminate between the depressed and non-depressed groups, and these items were therefore taken to comprise the DSRS. The test-retest reliability of this measure, as assessed on the group from the residential school for maladjusted children, was .80, indicating acceptable stability. Internal consistency was estimated using the split-half reliability coefficient to be .86, which is also satisfactorily high.

2.5.11 Section 11: Post-Traumatic Cognitions Inventory – child version

The Post-Traumatic Cognitions Inventory (PTCI; Foa, et al., 1999) is a 36 item self-report questionnaire devised for the purpose of measuring trauma-related thoughts and beliefs in adults exposed to trauma. The questionnaire was created with recent theoretical advances in mind, in particular cognitive models of PTSD. The development of the PTCI involved distributing a clinically derived set of 114 items to both large clinic referred and non-clinic referred participants (a total of 601 participants). The items were chosen to represent the concepts of general negative view of self, perceived permanent change, alienation from self and others, hopelessness, negative interpretation of symptoms, self-trust, self-blame, trust in other people, and unsafe world.

A factor analysis of the scores on these items of those participants who had been exposed to a traumatic event revealed a three-factor structure, where each factor upon inspection were labelled as negative cognitions about self, negative cognitions about the world, and self-blame for the trauma. A number of items were excluded at this point through their failure to load highly on any of these factors, on the basis of their content (so that the final questionnaire would contain items pertaining to different types of trauma) and so that the items remaining in the questionnaire would correlate with the measures of post-traumatic symptomatology. Thus, a 33-item questionnaire was produced. Each of the three factors present in this questionnaire had a high internal reliability, with Cronbach's alphas of .97 for negative cognitions about self,

.88 for negative cognitions about world, and .86 for self-blame. The total questionnaire had a Cronbach's alpha of .97.

The importance of the scale within samples of adults who have been exposed to trauma suggested that it would be worthwhile adapting this questionnaire for use with children. The scale was adapted therefore by the investigator and the investigator's supervisors, based on their experiences treating clients within the Maudsley Hospital Child Traumatic Stress Clinic. A 47 item questionnaire was produced (hereafter referred to as the cPTCI), which accommodated the items in the PTCI and items used by Steil and Ehlers (2000) to ensure that the concept of negative interpretation of symptoms was assessed. Additional items were included to assess persistent anger directed at those responsible for the trauma, and "omen formation", a phenomenon observed in case studies of child survivors of trauma (Terr, 1981; 1983) where children claim they had a sense that the trauma was going to happen. Children were able to respond by stating how much they agreed with each statement in one of four ways (either "don't agree at all", "don't agree very much", "agree a bit", or "agree a lot").

2.6 Study cohort

While using an "opt-in" consent procedure, 151 pupils at School A were invited to participate in Study 2. Of these pupils, 92 (60.9%) participated in the study. However, the bulk of this group were sixth formers, for whom, parental consent was not necessary; a far lower rate of participation was obtained with lower years. Given the large numbers of sixth formers who agreed to participate, no further sixth formers were invited to participate in the study.

Following the introduction of "opt-out" consent procedures, 60 pupils from School A were invited to participate in the study. Of these, 30 (50%) participated in the study. The remaining 30 pupils did not participate in the study because their parents denied their consent for them to participate, or the pupils themselves did not give their

consent to participation in the study. At School 2, where only an "opt-out" consent procedure was used, 222 pupils were invited to take part in the study. Of these, 132 (59.5%) participated in the study. In total, therefore, 433 pupils were invited to participate in Study 2, of whom 254 (58.7%) participated.

The demographic characteristics (age and sex) of participants in each school (and in the case of School A, participants recruited using "opt-in" and "opt-out" consent procedures) are presented in Table 2.1. It was not possible to obtain the demographic details of those pupils invited to participate in the study but who did wish to take part.

Table 2.1. Age and sex of participants at School A and School B

	School A					
	"Opt-in" sample	"Opt-out" sample	Total sample	School B[a]	Total population	Statistical tests[b]
Age						
Mean	16.48	12.59	15.57	13.41	14.45	p<.000 (Independent sample t-test, t=8.798, df=214.143)[c]
N	92	28	120	128	248	
Std. Deviation	1.62	.91	2.22	1.58	2.20	
Range	11.75-18.98	11.15-13.96	11.15-18.98	11.34-16.22	11.15-18.98	
Missing cases	0	2	2	4	6	
Sex						
Female	61	19	80	66	146	ns (χ^2 = 6.29, p<.012, df=1)
Male	31	11	42	66	108	

[a]Participants were only recruited from School B using "opt-out" consent procedures.
[b]Comparison were between the total sample drawn from School A and the sample drawn from School B.
[c]Homogeneity of variance for these samples was not demonstrated. The given statistic was calculated therefore without the assumption that the two samples possessed similar variance.

The group of pupils from School A participating in the study were significantly older than the pupils from School B. A chi square analysis revealed that there were significantly more girls than boys participating in the study, though inspection of Table 2.1 reveals that this difference was restricted to participants recruited from School A. This may have been due to the preponderance of females in the sixth form

of that school. These age and sex biases need to be considered when evaluating this study.

Chapter 3: Methodology for Study 2: A prospective study of children's psychological responses to assaults or RTAs following attendance at an A&E department in South London

3.1 Design

This study utilised a prospective longitudinal design involving assessment at three time points (two to four weeks, three months, and six months after a traumatic event).

3.2 Ethical permission

Ethical permission for the study was successfully sought from the Institute of Psychiatry Research Ethics Committee (Study No. 058/01) and King's College Hospital Research Ethics Committee (Study No. 01-186).

3.3 Participant population

Children attending King's College Hospital in South London following traumatic events were invited to participate in the study.

Inclusion criteria for participation in the study were:

- Attendance at A&E following a road traffic accident (RTA) or assault, and
- Aged 10-16 years.

Exclusion criteria for participation in the study were:

- Existing organic brain disease or learning disability,
- Sexual assault,
- Investigation by social services into the child's family circumstances, either initiated prior to their attendance at A&E, or as a result of their attendance,
- Inability to speak English,

- Potential threat to investigator (e.g. if the child's caregivers had been aggressive at A&E), and
- The child had been assaulted by a parent or step-parent living in his or her home

Children and adolescents attending the A&E department following a sexual assault were excluded from participating in this study as the investigator and all of the staff at the Maudsley Child Traumatic Stress Clinic were male. It would not have been possible, therefore, to offer female victims of sexual assault the offer of a female therapist if treatment and further assessment were required.

Children who were unable to read for themselves were still invited to participate in the study. If there was enough time the investigator assisted the children in completing the questionnaire batteries.

In order for children to participate in the study, both their and their principal caregiver's consent was required.

3.4 Procedure

Children attending the Accident and Emergency department of King's College Hospital (KCH) in South London following exposure to either an RTA or non-sexual assault were invited to participate in the study. The contact and attendance details of children meeting the inclusion criteria for the study were highlighted using the Footman-Walker reports software. The principal caregiver (typically the mother) of children attending KCH A&E between 22nd October 2001 and 29th September 2002 was contacted by letter and informed as to the nature of the study. Contained within this initial contact letter were information sheets for the child and caregiver, detailing why the study was being conducted, what participating in the study involved, and that the study was voluntary and that all information received through the study would be kept confidential (see Appendix B for copies of these information sheets and a sample

invitation letter). Three to four days after the initial contact letter was sent, the caregiver was contacted by telephone and asked if they would like to participate in the study. If they agreed to their child participating in the study, their child also was told about what the study involved, and asked for their consent to participate in the study. Written consent was obtained when the child and caregiver were met by the investigator for the first interview (for copy of consent form, see Appendix B). It was stressed to both caregiver and child that their involvement in the study was entirely voluntary, and that they could withdraw at any time.

Children and their principal caregiver were interviewed on two occasions, and asked to complete self-report questionnaires on three occasions in the six-months following the traumatic event.

The first assessment was conducted between two and four weeks after the RTA or assault. This involved explaining the nature of the study, gaining consent from both the child and the child's principal caregiver, conducting a semi-structured diagnostic interview schedule with child and caregiver, and both child and caregiver completing a battery of self-report questionnaires. The second assessment, conducted at three months after the RTA or assault, consisted of self-report questionnaires to be completed by child and caregiver. These questionnaire batteries were sent and returned by post. The third and final assessment was conducted at six months after the RTA or assault, and comprised a semi-structured diagnostic interview schedule with child and caregiver, and a questionnaire battery completed by child and caregiver.

Children found to have developed PTSD at the time of the final six-month assessment were offered treatment within the Maudsley Hospital Child Traumatic Stress Clinic.

3.5 Assessment interviews and self-report questionnaires

The primary assessment measure used in the study was a semi-structured diagnostic interview schedule. In addition to this, self-report questionnaires assessing

psychopathology (post-traumatic stress, depression and anxiety) and cognitive processes were distributed to children and their caregivers. In this sub-section the contents and development of these measures will be detailed.

3.5.1 Semi-structured diagnostic interview schedule

The Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions (ADIS-C/P) is a semi-structured interview schedule devised by Silverman and Albano (1996) for the assessment of anxiety disorders in children and adolescents, based on the diagnostic criteria laid out in DSM-IV. Interviews are conducted with both parent and child. Diagnoses are derived using both child and parent responses.

Silverman, Saavedra, and Pina (2001) note that the ADIS-C/P has been used in a number of childhood anxiety clinical trials (e.g. Barrett, Dadds, & Rapee, 1996; Beidel, Turner, & Morris, 2000; Kendall, 1994; Kendall, Flannery-Schroder, Panichelli-Mindel, Southam-Gerow, Henin, & Warman, 1997; Hayward, Varady, Albano, Thienemann, Henderson, & Schatzberg, 2000; Silverman, Kurtines, Ginsburg, Weems, Lumpkin, & Carmichael, 1999; Silverman, Kurtines, Ginsburg, Weems, Rabian, & Serafini, 1999; Spence, Donovan, & Brechman-Toussaint, 2000). In assessing the test-retest reliability of the ADIS-C/P, Silverman et al. (2001) conducted the interview with 62 children aged seven- to 16 years of age referred to a specialist childhood anxiety disorders clinic. Separation anxiety disorder, social phobia, specific phobia, generalized anxiety disorder, attention-deficit/hyperactivity disorder and oppositional defiant disorder were found to have good to excellent test-retest reliability (using kappa coefficients; Cohen, 1960). Disorders such as panic disorder, agoraphobia, post-traumatic stress disorder, and obsessive-compulsive disorder were not examined as the numbers of children and adolescents presenting with these disorders were too low.

Despite the lack of data regarding the reliability of the ADIS-C/P for the assessment of PTSD, it was considered to be the most appropriate interview measure of PTSD

available. This was due to its prominence in childhood anxiety disorders research, the ability of the schedule to be used effectively to assess a variety of disorders, the use of both parental and child assessment, the inclusion of an appropriate measure to assess the interference associated with each possible disorder, the use of DSM-IV in devising the schedule, and the availability of training in the use of the schedule.

The ADIS-C/P examines the vast majority of anxiety, affective, and behavioural disorders observed in children. Due to the constraints of time (and the limited usefulness which would be derived from examining highly improbable psychopathology) many disorders were not examined. PTSD/ASD, separation anxiety disorder, social phobia, specific phobia, panic disorder, agoraphobia, generalised anxiety disorder, obsessive-compulsive disorder, and major depressive disorder were investigated in both children and parents, while conduct disorder, oppositional defiant disorder, enuresis, and sleep terror disorder were examined by parent schedules only. The ADIS-C/P is designed such that each diagnosis can be discounted after one or two key questions. In the case of the PTSD/ASD diagnoses, however, all questions were asked of each child or parent, regardless of their answers.

Prior to using this assessment tool in the study it was considered necessary to include several additional items in the interview schedule. These additional items are detailed in the following sub-sections.

3.5.1.1 Items added to the ADIS-C/P

3.5.1.1.1 The addition of items for assessing the dissociation criterion of Acute Stress Disorder

A key aim of Study 2 was to examine the usefulness of the Acute Stress Disorder (ASD) diagnosis in predicting chronic reactions to trauma in children and adolescents. As far as the present investigator is aware, there are no studies published that have examined the prevalence of ASD in children and adolescents as it is defined

by DSM-IV and using a standardised interview with the child. Questionnaire items assessing the dissociation items of ASD, to be included in the interview schedules for both parent and child at the initial (2-4 week) interview, were developed. This development was guided by the DSM-IV criteria for ASD, ASD interview schedules developed for use with adults (Bryant, Harvey, Dang, & Sackville, 1998; Bryant & Harvey, 2000), existing work on child dissociation (Putnam, Helmers, & Trickett, 1993), and the experience of staff at the Maudsley Hospital Child Traumatic Stress Clinic.

DSM-IV lists five dissociative symptoms, of which three are required for an individual to meet the dissociation criterion for ASD. As this was the first attempt to investigate ASD in children and adolescents, a thorough examination of each symptom was considered necessary, in particular to compensate for the linguistic subtlety associated with these symptoms, and to assess what was the best possible method for examining these difficult to define phenomena. Each dissociation symptom was assessed using two or three items, and each item was asked twice; once relating to the child or adolescent's experience during the trauma, and a second time relating to their experience since the trauma. Thus four or six items were included in the interview schedule to assess each dissociation symptom.

These items were included in the ADIS-C/P immediately after the items assessing whether the trauma met Criterion A for ASD/PTSD. The items included to assess the dissociation criterion of ASD are displayed in Table 3.1.

Table 3.1. Questions used to assess Acute Stress Disorder Criterion B (dissociation) symptoms in children and adolescents

Criterion B symptom	Question
Detachment	When the [trauma] was happening did you feel numb or empty inside?
	When the [trauma] was happening, did you feel so shocked that you didn't feel anything?
	Since the [trauma] happened, have you ever felt numb or empty inside?
	Since the [trauma] happened, have you ever felt so shocked that you haven't felt anything?
Reduced awareness	When the [trauma] was happening, did you feel as if you were in a daze?
	When the [trauma] was happening, did you feel as if you weren't noticing what was going on around you?
	Since the [trauma] happened, have you ever felt as if you were in a daze?
	Since the [trauma] happened, have you felt as if you weren't noticing what was going on around you?
Derealization	When the [trauma] was happening, did you feel as if things around you weren't real?
	When the [trauma] was happening, did you feel as if you were in a dream or a movie?
	Since the [trauma] happened, have you felt as if things around you weren't real?
	Since the [trauma] happened, have you felt as if you were in a dream or a movie?
Depersonalization	When the [trauma] was happening, did you feel as if your body didn't really belong to you?
	When the [trauma] was happening, did you feel that you were outside your body?
	When the [trauma] was happening, did you feel that you weren't really there?
	Since the [trauma] happened, have you felt as if your body doesn't really belong to you?
	Since the [trauma] happened, have you felt as if you were outside your body?
	Since the [trauma] happened, have you felt as if you're not really where you actually are?
Amnesia	Is there a gap in your memory of what happened during the [trauma]?

NB All responses were rated either yes or no.

3.5.1.1.2 The addition of items assessing re-experiencing (Criterion B) symptoms

A significant flaw regarding the ADIS-C/P scope for assessing re-experiencing symptoms was noted. The presence of the re-experiencing symptom "acting or feeling as if the traumatic event were recurring" is assessed using the items "Do you sometimes feel that [frightening event] is about to happen again?" (child interview) or "Do you think that [he or she] sometimes feels that [frightening event] is about to happen again?" (parent interview). It was considered that these items did not fully capture the sense of reliving the traumatic experience, and instead focused on a sense of apprehension. The items "When you remember the (frightening event), do you feel that you are back there again, or that it is happening all over again?" (child interview) and "When your child remembers the (frightening event) does (he or she) feel as if she is back when it actually happened, or that it is happening again?" (parent interview) were therefore added to this section of the interview schedules.

Given the importance attached to the quality of the memories and intrusive recollections of a traumatic experience by many of the more recent cognitive models of PTSD (Brewin et al., 1996; Ehlers & Clark, 2000), children and parents were given additional prompts following the items in the reexperiencing symptoms section that examine the DSM-IV symptom "recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions". In ADIS-C/P this item is investigated using the items "Do you have a lot of thoughts that you don't want to have about [trauma]?" (child version) and "Does you child complain of thoughts about [trauma] that [he or she] doesn't want to have?" (parent version). The prompts were aimed at examining whether the intrusive memory was in the form of pictures or thoughts/words.

3.5.1.1.3 Other information gathered during the interview

Questions concerning the child's background were put to each child's parent, prior to commencing the diagnostic interview schedule. At the initial (2-4 week) interview these questions pertained to:

- the child's school,
- the parent's marital status and employment,
- the child's family composition (including the number of siblings, who else lives at home, and was anyone else from the family involved in the trauma),
- a brief description of what happened during the traumatic event,
- how long the child was at A&E/hospital for,
- what were the child's injuries,
- the extent of the child's remaining injuries,
- time spent off school,
- the extent of physical and psychological injury in other people involved in the trauma,
- whether the child had been involved in any trauma previously, and the child's psychological reaction to such an event,
- and whether the child had ever received any medical help for a emotional, behavioural or psychiatric problem.

Prior to the diagnostic interview schedule with the parent at 6 months post-trauma, the following information was also sought:

- has the child been involved in any other traumatic events since the event that initially caused the child to attend King's College Hospital A&E department,
- has there been any legal action associated with the trauma (e.g. a Police investigation, criminal or civil proceedings, etc.), and if so, are the parent and child satisfied with the outcome of these actions,
- has the child received any professional support for his or her psychological reaction to the trauma,
- and does the child experience ongoing health problems as a result of the trauma.

3.5.1.2 Investigator training and supervision in the use of ADIS-C/P

The investigator was trained in the use of the ADIS-C/P by clinicians at the Maudsley Hospital Child Traumatic Stress Clinic. This training involved detailed instruction as to how to conduct the ADIS-C/P, and supervised interviews conducted with client families referred to the Maudsley Hospital Child Traumatic Stress Clinic.

The ongoing quality of the interviews was maintained by 1) regular supervision meetings with the investigator's supervisors where queries arising from the interviews might be discussed, 2) one of the investigator's supervisors (Dr Patrick Smith) attending actual interviews conducted with participating families and providing feedback concerning the investigator's interview technique, and 3) the tape recording of a sample of the interviews conducted, so that the inter-rater reliability estimates might be made. Children and parents whose interviews were recorded completed a consent form agreeing to this procedure (se Appendix B for a copy of this form). Tape recordings of the randomly selected interviews, 11 from the initial assessment and 10 from six month follow up assessment, were rated by one of the investigator's supervisors. The clinician/researcher who conducted these ratings, Dr Patrick Smith, had seven years' experience of assessing and treating traumatic stress reactions in children and adolescents, and was blind as to the principal investigator's diagnosis in each case. There was unanimous agreement between raters for both the ASD diagnosis at initial interview (Kappa = 1.00) and the PTSD diagnosis at 6 month follow up (Kappa = 1.00).

3.5.1.3 Interview environment and procedure

Families who consented to participate in the interview were given the choice as to where the assessment interview took place. Families were interviewed either at rooms within the Department of Psychology at the Institute of Psychiatry, or at the participant family's home. Offering families this choice was necessary for increasing the participation rate of families invited to take part in the study, and for overcoming

simple impracticalities (e.g. travel, looking after other children, finding a quiet place at home, etc.) that prevented families from participating.

When conducting the interviews, parent and child were generally interviewed separately, except for a few cases where the child was too distressed to be interviewed on their own. At the first (two to four week) assessments both parent and child were reminded as to why the study was being conducted, what participating in the study involved, and that the study was voluntary and any information given would be confidential. A brief check was made at the beginning of the final (six month) interview to ensure that both parent and child were still happy to participate in the study and to see if they had any questions. At each assessment the child was then asked to complete the questionnaire battery while the parent was interviewed. Once both the parent interview had finished and the child had completed the questionnaire booklet, the child was then interviewed and the parent was asked to complete a questionnaire booklet (see following sections).

Two to three days following the initial assessment, parents were contacted by telephone to check that the child had not experienced any distress during the assessment that the investigator was not aware of. The participant family was sent a thank you letter following both the initial and final interview.

3.5.1.4 Duty of care

Prior to commencing the study the investigator was briefed by the investigator's supervisors as to what to do in the event that a participant child was discovered to be at a high risk of seriously injuring themselves or others. It was agreed that in these instances the investigator's supervisors should be contacted as soon as possible, and that potential interventions be discussed. In the case of three children it was necessary for the investigator to contact the investigator's supervisors following the child's responses in the interview indicating that they were depressed and were contemplating suicide, or had recently made a suicide attempt.

In one instance it was felt, on discussion, that the child was not very likely to act on her suicidal ideation, and the child and her mother were advised what to do should the child's mood worsen or the child think more seriously about committing suicide. In two other instances, it was decided that the child should be seen as soon as possible by a member of the child's nearest Child and Adolescent Mental Health Service (CAHMS). Each child was assessed by a psychiatrist, and treated accordingly. In each of the three cases the family remained in the study and completed the final (6 month) assessment. At this time no child required further emergency support.

3.5.2 Self-report questionnaires

A number of self-report questionnaires were used in this study, in addition to the diagnostic interview schedule detailed above. These questionnaires were used to obtain a quantitative assessment of child and parent psychopathology in the months following the trauma, and to assess the cognitive styles, appraisals, and coping processes adopted by child and parent adopted following the trauma.

The following sub-sections detail the self-report questionnaires completed by children and their parents at each time point.

3.5.2.1 Child self-report questionnaires

An overview of the questionnaires completed by children at each assessment point is presented in Table 3.2.

Table 3.2. Self-report questionnaires completed by children in Study 1 by assessment point

Assessment point	Psychopathology measures	Trait/attitude/cognition measures
2-4 weeks	• Birleson Depression Self-Rating Scale (BDSRS) • Revised Impact of Event Scale (child version; RIES-C)	• Attitudes towards Emotional Expression questionnaire (child version; AEE) • Childhood Anxiety Sensitivity Scale (CASI) • Memory Modality Questionnaire (MMQ) • Meta-Cognitions Questionnaire (positive beliefs about worry sub-scale, child version; MCQ-C) • Peritraumatic cognitions (mental confusion, detachment/dissociation, initial anger, life threat and distress, anger, appraisal of adults' distress) • Response styles questionnaire (child version; RSQ-C) • Thought Control Questionnaire (child version; TCQ-C)
3 months	• BDSRS • Child Post-Traumatic Symptom Scale (CPSS) • Revised Child Manifest Anxiety Scale (RCMAS) • RIES-C	• Post-traumatic Cognitions Inventory (child version; PTCI-C) • Thought suppression, distraction, and rumination items
6 months	• As at three months	• As at three months

Four concerns provided the rationale for the contents of the three child questionnaire batteries. Firstly, sufficient assessment of child psychopathology at each time point was considered important. Due to the importance of the initial assessment point, only two psychopathology measures were used at this assessment (the Birleson Depression Self-Rating Scale and the child version of the Revised Impact of Event Scale), though the three and six month follow-up assessment batteries comprised four psychopathology measures (the Birleson Depression Self-Rating Scale, the child version of the Revised Impact of Event Scale, the Child Post-Traumatic Symptom Scale, and the Revised Child Manifest Anxiety Scale).

Secondly, a key aim of the study was to examine how a range of non-trauma-specific cognitive styles that the child possessed prior to the trauma were related to the child's short- and long-term appraisals of the trauma and its sequelae, the child's strategies for coping with the trauma, and through these pathways, the child's post-traumatic stress symptoms. Since it was not possible to conduct a fully prospective study (where assessments were conducted prior to the trauma) the measures examining these cognitive styles were distributed in the initial questionnaire battery; since these questionnaires were not trauma-specific, it was assumed that children's responses on these measures would reflect higher-order beliefs and would not be altered radically in the 2-4 weeks since the trauma. The measures assessing cognitive styles were Attitudes towards Emotional Expression questionnaire (child version), the Childhood Anxiety Sensitivity Inventory, the positive beliefs about worry sub-scale of the Meta-Cognitions Questionnaire (child version), the Response Styles Questionnaire (child version), and the Thought Control Questionnaire (child version).

Thirdly, another key aim of the study was to examine the role of the nature of the child's memory of the trauma in the onset of PTSD. To this end a questionnaire examining the quality of the child's memories (the Memory Modality Questionnaire) was included in the initial questionnaire battery.

Fourthly, the capacity of negative appraisals about self, the world, and the impact of the trauma, and maladaptive coping strategies to maintain post-traumatic stress symptomatology was assessed by including measures of these appraisals and strategies (the child version of the Post-Traumatic Cognitions Inventory and thought suppression, distraction, and rumination items) at the second (postal) and third assessment points.

A description of each questionnaire completed by children in Study 2 is given below. Copies of each of the questionnaires are included in Appendix B. As the six month

questionnaire battery was identical to the three month questionnaire battery, no copy of this battery has been included.

3.5.2.1.1 Attitudes towards Emotional Expression (AEE)

Following evidence that the failure to confide traumatic events is stressful and associated with increased health problems (Pennebaker, Hughes, & O'Heeron, 1987), Joseph, Yule, Williams and Hodgkinson (1994) investigated the role of attitudes towards emotional expression in the development of PTSD in a sample of adults involved in the *Herald of Free Enterprise* ferry disaster.

A four-item questionnaire devised for the purpose of examining attitudes towards emotional expression was distributed to 73 survivors of the disaster, two years after it occurred. Participants were invited to respond to the items presented by indicating how much they agreed with each one by way of a five-point scale ranging from "agree very much" to "disagree very much". The measure was found to have good internal reliability (Cronbach's alpha = .74). The questionnaire was slightly adapted for this study such that children would be able to comprehend each item more easily. Children respond by stating how much they agreed with each of the four items (either "don't agree at all", "don't agree very much", "agree a bit", or "agree a lot").

3.5.2.1.2 Birleson Depression Self-Rating Scale (BDSRS)

The Birleson Depression Self-Rating Scale (BDSRS; Birleson, 1981) was included as a measure of depressive symptomatology. The BDSRS comprises 18 items, to which children can respond "most", "some-times", or "never" (for further information on this measure see sub-section 2.5.10 of the previous chapter).

3.5.2.1.3 Child Post-traumatic Symptom Scale (CPSS)

The CPSS (Foa, Johnson, Feeny, & Treadwell, 2001) was developed to assess the severity of DSM-IV PTSD symptoms in children exposed to trauma. Foa et al. (2001) administered the instrument to 75 children two years after they had been exposed to an earthquake. The CPSS was found to possess good internal consistency (alpha coefficient = .89) and moderate test-retest reliability (kappa = .55). Unlike earlier measures for assessing child PTSD symptomatology, the CPSS entirely maps on to each of the 17 DSM-IV symptoms for PTSD, and includes six items assessing the interference with the child's life resulting from PTSD symptoms. It is therefore possible to derive a diagnosis from responses to the instrument.

Children are able to respond to each symptom item in one of four ways ("not at all or only one time", "once a week or less/once in a while", "2 to 4 times a week/half the time", or "5 or more times a week/almost always", scored 0, 1, 2, and 3, respectively), and to each interference item "yes" or "no".

3.5.2.1.4 Childhood Anxiety Sensitivity Index (CASI)

The CASI (Silverman, Fleisig, Rabian, & Peterson, 1991) is an adaptation of the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986). The ASI was devised as a measure of the "individual difference variable consisting of beliefs that the experience of anxiety/fear causes illness, embarrassment or additional anxiety [p.1-2]". Anxiety sensitivity has been identified as being closely associated with several anxiety disorders (Taylor, et al. 1992).

A growing body of evidence has suggested that this construct is also a unique predictor of trait anxiety in children, and has potential implications for the assessment and treatment of anxiety (Silverman & Weems, 1999). While there is some disagreement over the age at which anxiety sensitivity might influence general anxiety and fearfulness (where Silverman & Weems, 1999, argue persuasively in support of their finding that younger children are affected by their anxiety sensitivity), children aged eight to ten years would be expected to possess the

cognitive capacity to be concerned with abstract objects of fear, such as going crazy, losing control, or death.

The CASI is an 18-item measure where one of three responses can be made ("none", "some", or "a lot") to each item. In Silverman et al.'s (1991) initial evaluation study, both a non-clinical and a clinical sample demonstrated that the measure had an internal consistency of .87 (Cronbach's alpha).

3.5.2.1.5 Memory Modality Questionnaire (MMQ)

The same form of the MMQ as used in Study 1 was used in Study 2 to examine the nature of the children's memories of the traumatic event they reported. For further information on the MMQ see sub-section 2.5.5. Parents who were also involved in the trauma completed the same version of the measure (see sub-section 3.5.2.2.5 below).

3.5.2.1.6 Meta-Cognitions Questionnaire - Positive beliefs sub-scale (MCQ)

The MCQ was devised by Cartwright-Hatton and Wells (1997) in order to measure beliefs about worry and intrusive thoughts. Wells' (1995) meta-cognitive model of worry proposes that positive and negative beliefs about worrying are a key feature of Generalised Anxiety Disorder.

A version of the 'positive beliefs about worry' sub-scale was adapted for use with children in this study. This sub-scale was selected as Cartwright-Hatton and Wells' (1997) data suggested that some individuals might be more likely to worry due to positive beliefs they held about worrying. Such pre-existing views concerning the merits of worry may encourage individuals who have experienced a traumatic event to elaborate on further possible danger, contributing to the maintenance of a sense of current threat (Ehlers & Clark, 2000).

The adapted MCQ consists of the 19 items of the 'positive beliefs about worry' sub-scale, and was slightly amended at points to make the items more comprehensible for children. Children were able to respond by indicating how much they agree with each item presented (either "do not agree", "agree slightly", "agree moderately", or "agree very much"). The original adult version of the measure possessed good internal reliability (Cronbach's alpha = .87).

3.5.2.1.7 Peritraumatic cognitions

A questionnaire was devised, based on a number of studies conducted in children and adults, which assessed a variety of appraisals, emotions, and dissociative states that can occur in people during, or immediately after, a traumatic event. These questionnaire items pertained to feelings of confusion/disbelief, the dissociative states of depersonalisation and derealisation, general fear and fear of being seriously hurt or killed, and anger directed towards self or other people held to be responsible for the trauma. An additional item was included for the child to rate the fear of any adults who were present during the trauma.

In total 13 items were included in this questionnaire. Children could respond "disagree a lot", "disagree a bit", "agree a bit, or "agree a lot" to the presented items, except for the final item that assessed adult fear, which allowed for the responses "not at all frightened", "a bit frightened", "quite frightened", or "very frightened".

3.5.2.1.8 Post-traumatic Cognitions Inventory, child version (cPTCI)

The child version of the post-traumatic cognitions inventory (cPTCI; Foa et al., 1999) assesses children's appraisals of themselves, the world, the psychological sequelae of a traumatic event, persistent anger, and omen formation (see sub-section 2.5.11 of the previous chapter for further details of this measure and the development of the child version). This measure comprises 47 items, to which children can respond "don't agree at all", "don't agree a bit", "agree a bit", or "agree a lot".

3.5.2.1.9 Response Styles Questionnaire (rumination sub-scale; child version; RSQ)

The Response Styles Questionnaire (RSQ) was devised by Nolen-Hoeksema (1991) as a measure of those 'ruminative responses [that] involve repetitively focusing on the fact that one is depressed; on one's symptoms of depression; and on the causes, meanings, and consequences of depressive symptoms [p.569]'. Nolen-Hoeksema, who has pioneered the study of this phenomenon, viewed the ruminative response style as 'a pattern of behaviors and thoughts that focus the individual's attention on his or her emotional state and inhibit any actions that might distract the individual from his or her mood [1991; p. 569]'. Rather than highlighting specific cognitions, Nolen-Hoeksema places emphasis on the function of a behavioural-attentional style that has the effect of maintaining or worsening their mood, increasing the likelihood that their thinking will be negatively biased by their mood, and decreasing accessibility to solutions to their problems.

The RSQ (rumination sub-scale), when first distributed to 137 students participating in a study of depression and coping after an earthquake (Nolen-Hoeksema & Morrow, 1991) was found to have good internal reliability (Cronbach's alpha = .89). The 22 items included in this instrument were adapted for use with children, and one item ("I listen to sad music") was excluded because of its inappropriateness for younger children. Further adaptations were made to make the items relevant to feelings of fearfulness as well as sadness. This was done so that the focus of the questionnaire would be on the respondent's *responses* to negative emotions, not the strength or direction of the emotions themselves. In addition, children's responses to trauma are characterised by fear as much as (if not more than) sadness.

As in the adult version of the measure, four responses to each item could be made; in the child version these were "never", "sometimes", "often", and "always".

3.5.2.1.10 Revised Child Manifest Anxiety Scale (RCMAS)

The RCMAS was devised by Reynolds and Richmond (1978) as an improved version of an earlier child manifest anxiety scale (Castaneda, McCandless, & Palermo, 1956). Their final version, following evaluation, consisted of 28 items including nine lie scale items. The measure was found to have good internal reliability (KR_{20} of .85).

The RCMAS is widely used in research and clinical practice for assessing anxiety in children (Muris, Merckelbach, Ollendick, King, & Bogie, 2002; Schniering, Hudson, & Rapee, 2000). Children can respond either "yes" or "no" to each questionnaire item.

3.5.2.1.11 Revised Impact of Event Scale (child version; RIES-C).

The child version of the Revised Impact of Event Scale (RIES-C; see sub-section 2.5.9 of the previous chapter for further details) was included as a measure of participants' post-traumatic stress symptoms in response to the traumatic event they had experienced. The RIES-C comprises 13 items, to which children can respond "not at all", "rarely", "sometimes", or "often".

3.5.2.1.12 Thought Control Questionnaire (child version; cTCQ)

The Thought Control Questionnaire (TCQ; Wells & Davies, 1994) was adapted for use with children (see sub-section 2.5.8 in the previous chapter for further details on this questionnaire), and included in Study 2 as a means of measuring in greater detail the kinds of strategies used by children in coping with any distressing and unwanted memories or thoughts. The child version of the TCQ comprises 30 items, to which children can respond "never", "some-times", "often", or "almost always".

3.5.2.1.13 Thought suppression, distraction and rumination items

A brief five item questionnaire was developed to examine how often children use thought suppression (one item) and distraction (one item) to cope with intrusive memories of the traumatic event, and the extent to which they ruminate over what happened to them (three items). Unlike the other measures relating to these strategies (the RSQ and the TCQ) these items measured the extent to which the strategy is used to cope specifically with symptoms relating to the traumatic event. Children can respond "disagree a lot", "disagree a bit", "agree a bit", or "agree a lot" to the thought suppression and distraction items, and "never", "sometimes", "often", or "almost always" to the rumination items.

3.5.2.2 Parent self-report questionnaires

An overview of the questionnaires completed by parent at each assessment point is presented in Table 3.3.

Table 3.3. The self-report questionnaires completed by parents in Study 1, by assessment point

Assessment point	Psychopathology measures	Trait/attitude/cognition measures
2-4 weeks	• Posttraumatic Stress Diagnostic Scale (PDS) • Beck Depression Inventory (BDI) • State Trait Anxiety Inventory (STAI)	• Anxiety Sensitivity Inventory (ASI) • Attitudes towards Emotional Expression (AEE) • Memory Modality Questionnaire (MMQ)[a] • Meta-Cognitions Questionnaire (positive beliefs about worry sub-scale; MCQ) • Peritraumatic cognitions (mental confusion, detachment/dissociation, initial anger, life threat and distress, anger, appraisal of child's distress)[a] • Response Styles Questionnaire (RSQ) • Thought Control Questionnaire (TCQ)
3 months	• PDS • BDI • STAI	• Family functioning questionnaire (FFQ) • Thought suppression, distraction, and rumination items
6 months	• As at three months	• As at three months

[a] If present at the time of the traumatic event

The self-report questionnaires completed by parents were chosen to reflect three concerns. Firstly, an examination of parental psychopathology in the months following the trauma was considered highly necessary, both to evaluate the degree of distress suffered by parents following trauma, but also to allow for an examination of the analysis of the relationship between child and parent PTSD symptoms. Four measures were included in the questionnaire battery at each assessment point for this purpose (the Posttraumatic stress Diagnostic Scale, the Beck Depression Inventory, and the State Trait Anxiety Inventory).

Secondly, examining parental scoring on adult versions of the scales completed by their children (assessing their cognitive styles and coping strategies) will assist in identifying the strength of relationship between child and parental post-traumatic cognitive styles and coping. These data will be relevant to cognitive-behavioural interventions for children with PTSD as clinicians will be able to work with both children and parents to modify maladaptive appraisals and ways of coping, rather than working solely with children and giving them advice that conflicts with advice given, implicitly or explicitly, by their parents. As with children participating in the study, cognitive style, appraisal, and coping strategy questionnaires (the Anxiety Sensitivity Inventory, the Attitudes towards Emotional Expression questionnaire, the Memory Modality Questionnaire, the positive beliefs about worry sub-scale of the Meta-Cognitions Questionnaire, Response Styles Questionnaire, the Thought Control Questionnaire, and thought suppression, distraction, and rumination items) were included in the initial questionnaire battery for parents.

Thirdly, some index of the disruption brought to the child's family by the trauma and its sequelae was thought necessary. Therefore, a single questionnaire (the Family Functioning Questionnaire) was included to obtain a parental report concerning family functioning following the trauma. This questionnaire was included in the second and third assessments.

A description of each self-report measure completed by parents is given in the following sub-sections.

3.5.2.2.1 Anxiety Sensitivity Inventory (ASI)

The Anxiety Sensitivity Index (ASI; Reiss, et al., 1986) is a measure of an individual's negative beliefs about the experience of anxiety and anxious symptoms (please see sub-section above for fuller description and background). The ASI comprises 16 items, to which the participant can respond by indicating "very little", "a little", "some", "much", or "very much". When distributed to a sample of students, Reiss and colleagues found that the measure possessed a high test-retest reliability (Pearson product-moment correlation = .75).

3.5.2.2.2 Attitudes towards Emotional Expression (AEE)

The AEE was used to assess attitudes towards emotional expression in adult survivors of a ferry disaster (Joseph, et al., 1994; please see sub-section 3.5.2.1.1 above for full description). The AEE comprises four items, to which participants can respond "don't agree at all", "don't agree very much", "agree a bit", or "agree a lot".

3.5.2.2.3 Beck Depression Inventory (BDI)

The BDI (Beck, Rush, Shaw & Emery, 1979) is a 21-item inventory that measures depression in adults. The inventory has good internal reliability, with a Cronbach's alpha of .81 (Beck, Steer, & Garbin, 1988). Participants indicate their responses by selecting one or more of the four sentences that comprise each questionnaire item.

3.5.2.2.4 Family functioning questionnaire (FFQ)

The FFQ is a 12-item questionnaire developed by McFarlane (1987b) to assess the role of family functioning on the maintenance of post-traumatic symptomatology in

children following a bush-fire. The FFQ was distributed to both a sample of families exposed to the bush fire (n=183) and to a large non-traumatised sample (n=497). The questionnaire was completed by parents. The questionnaire was found to comprise two factors, titled "irritable distress" and "involvement". These factors had internal reliability Alpha coefficients of .76 and .78 respectively. A further two items were included within the measure to assess maternal overprotection. Parents respond to each item by indicating "does not apply", "applies somewhat", or "certainly applies" (scored 0, 1, and 2 respectively).

3.5.2.2.5 Memory Modality Questionnaire (MMQ)

The MMQ was distributed to parents who had witnessed the same trauma as their child. The MMQ completed by parent participants was the same as that completed by child participants (please sub-section 2.5.5 in previous chapter for fuller description of instrument). The MMQ comprises 14 items to which participants can respond "don't agree at all", "don't agree a bit", "agree a bit", or "completely agree".

3.5.2.2.6 Meta-Cognitions Questionnaire (positive beliefs about worry sub-scale; MCQ)

The positive beliefs sub-scale of the MCQ was used to assess parents' positive views about the usefulness of worrying (please see sub-section *3.5.2.1.6* above for further information about this instrument). This sub-scale of the MCQ comprises 19 items, to which participants can respond "do not agree", "agree slightly", "agree moderately", and "agree very much".

3.5.2.2.7 Posttraumatic Stress Diagnostic Scale (PDS)

The PDS is a self-report measure of adult PTSD that, in addition to giving a continuous measure of post-traumatic symptomatology, is capable of producing a diagnosis (Foa, 1995; Foa, Cashman, Jaycox, & Perry, 1997). Participants are asked

to rate how much they are bothered by each of the PTSD symptoms included in the DSM-IV on a four-point scale. The PDS has good internal consistency (r=.92) and good test-retest reliability (r=.74 for PTSD diagnosis, and .83 for symptom severity). Respondents are asked to indicate how frequent and distressing each of the 17 PTSD items are, then indicate how much (on a 0-10 scale) how the PTSD symptoms have interfered with the person's work, social life and family life, and how much they have to come to terms with what happened and how upset they are when they think of the trauma (on a 0-100 scale).

3.5.2.2.8 Response Styles Questionnaire (Rumination sub-scale; RSQ)

The rumination sub-scale of the RSQ (Nolen-Hoeksema, 1991) examines a cognitive style where attention on focused on the individual's emotional state (please see sub-section 3.5.2.1.9 above for fuller discussion of this scale). This measure was completed by parents participating in the study, and, as with the child version scale, was slightly adapted to include references to fear as well as sadness. The RSQ rumination sub-scale comprises 22 items, to which participants can respond "never", "some-times", "often", or "always".

3.5.2.2.9 State-Trait Anxiety Inventory (STAI)

The STAI (Spielberger, et al. 1983) is a widely used measure of adult anxiety. The state anxiety section of the STAI was used so as to avoid duplication of the measures, and since the main objective in using the scale was to obtain an assessment of the parent's recent anxious symptomatology. The STAI has good internal consistency, with Cronbach's alpha coefficients of between .86 and .95 (Spielberger, et al., 1983). The state anxiety section of the STAI contains 20 items, to which participants can respond by indicating one of four responses ("not at all", "somewhat", "moderately so", or "very much so").

3.5.2.2.10 Thought Control Questionnaire (TCQ)

The TCQ (Wells & Davies, 1994) was devised to measure strategies for coping with unpleasant and unwanted thoughts (please see sub-section 2.5.8 in previous chapter for more detailed description of this measure). The full 30-item measure was distributed to parents of children participating in the study. Participants can respond to each item in the TCQ in one of four ways: "never", "sometimes", "often", or "almost always".

3.5.2.2.11 Thought suppression, distraction and rumination items

As with children in the study, a brief five item questionnaire was developed to examine how often parents used thought suppression (one item) and distraction (one item) to cope with intrusive memories of the traumatic event, and the extent to which they ruminate over what happened to them and their child (three items). Unlike the other measures relating to these strategies (the RSQ and the TCQ) these items measured the extent to which the strategy is used to cope specifically with symptoms relating to the traumatic event. Parents can respond "don't agree at all", "disagree slightly", "agree slightly", "completely agree" to the thought suppression and distraction items, and "never", "sometimes", "often", or "almost always" to the rumination items.

3.6 Other information relating to the trauma

The following additional information regarding the child's attendance at King's College Hospital A&E department was also recorded:

- Ethnicity,
- Diagnosis and sub-diagnosis given by A&E staff,
- Attendance outcome (e.g. discharged, discharged to see General Practitioner for follow-up, etc.),

- If trauma was an RTA, the type of accident (e.g. pedestrian, on a bike, in a car, etc.),
- Triage category (i.e. A&E nurse's assessment of how urgently treatment is required)[1],
- Heart rate, blood pressure, respiratory rate, and Glasgow Coma Scale score at first assessment made by A&E staff or paramedics, and
- If admitted to hospital, how long child remained in hospital.

3.7 Study cohort

In this section details of the study cohort will be provided, including the participation rate, and trauma and demographic characteristics of participants and non-participants.

3.7.1 Participation rate

Children were recruited from King's College Hospital A&E department between 22nd October 2001 and 29th September 2002. During this period, 409 children attending the A&E department were registered by the Footman-walker reports software as meeting the inclusion criteria of the study. Of these cases, 21 had been erroneously categorised as assaults or RTAs, 20 were instances of parental abuse or situations where social services were involved, 15 were attending for the second time following the same incident, three were unable to speak English, two were attending following a sexual assault, one involved a child referred to the A&E department from another hospital, one involved a child whose date of birth had been recorded incorrectly and was not eligible to participate, one had received a severe traumatic brain injury, one involved a family where the investigator was thought to be at possible risk of injury,

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[1] A triage category of "1" is given if a patient needs to be treated immediately, "2" if the need for treatment is "very urgent" (i.e. within 10 minutes), "3" if the need for treatment is "urgent" (i.e. within an hour), and "4" if the need for treatment is "standard" (i.e. within two hours). A higher triage number therefore indicates less severe injury. When children arrived by ambulance it was common for them not to receive a triage category.

and one case involved a child with severe learning disabilities. Therefore, a total of 66 cases had to be discarded as they met exclusion criteria for the study.

Of the 343 cases that met inclusion criteria and failed to meet exclusion criteria for the study, 119 (34.7%) were not contactable due to inaccurate or incomplete records within the A&E department, 116 (33.8%) did not wish to participate in the study, two (.6%) were immediately referred for treatment for the effects of prior trauma, and 106 (30.9%) agreed to participate in the study.

Of the 106 cases that agreed to participate in the study, 50 (47.2%) returned the three month questionnaire battery, and 67 (63.2%) completed the six month assessment. No significant differences in initial PTSD symptomatology were observed between participants who completed all assessments and those failed to complete either the three or six month assessments (in terms of either self-reported PTSD symptomatology on the RIES-C or by ASD diagnoses). Thus, despite the marked cohort attrition (especially at the three month assessment), the participants who completed the follow-up assessments were representative of the initial sample.

3.7.2 Demographic information

Demographic and trauma-related data obtained from King's College Hospital A&E department about both participants and non-participants are presented in Table 3.4.

While no difference between the participants and non-participants was found with regards to their sex, trauma type, triage category, or ethnicity, non-participants were demonstrated to be significantly older than participants. This feature of the population of children who participated in the study, as well as the relatively low proportion of children who agreed to participate in the study, are important findings that have to be considered when interpreting the results of this study.

Table 3.4. Age, sex, trauma type, triage category, and ethnicity of participants and non-participants

	Participants (n=106)	Non-participants (n=237)	Total sample (n=343)	Statistical tests
Age:				
Mean	13.99	14.76	14.52	p<.001 (Independent sample t-test, t=3.54, df=340)[a]
Std. Deviation	1.93	1.86	1.91	
N	106	236	342	
Missing cases	0	1	1	
Range	10.13-16.99	10.04-16.97	10.04-16.99	
Sex:				
Female	39	74	113	ns (χ^2 = 1.02, p=.311, df=1)
Male	67	163	230	
Trauma type:				
Assault	60	157	217	ns (χ^2 = 2.93, p=.087, df=1)
RTA	46	80	126	
Triage Category:				
1	7	21	28	
2	0	3	3	
3	16	33	49	ns (χ^2 = 2.64, p=.620, df=4)
4	76	155	231	
Ambulance	6	18	24	
Missing	1	7	8	
Ethnicity:				
Black African	17	28	45	
Black Caribbean	18	48	66	
Black Other	22	65	87	ns (χ^2 = 8.27, p=.219, df=6)
Indian	1	0	1	
Other	11	17	28	
Pakistani	1	0	1	
White	36	71	107	
Missing	0	8	8	

[a]Homogeneity of variance for these samples was demonstrated (Levene's test, F=1.02, p=.312).

Chapter 4: Psychometric properties of novel measures invented or adapted for this investigation

4.1 Novel measures used in both Study 1 and Study 2

Three novel instruments were designed for this investigation and completed by participants in both Study 1 and Study 2. As two of these measures (the child version of the Post-Traumatic Cognitions Inventory and the child version of the Thought Control Questionnaire) were adapted from adult measures identified as having significant factor structures, and one new measure was designed specifically for this investigation (the Memory Modality Questionnaire), it was considered necessary to submit these measures to principal components analysis. This would have the effect of identifying meaningful component structures, and removing redundant items (thereby aiding future use of the measures in clinical settings).

The following analysis strategy was devised. In order to meet the numbers of cases needed for the principal components analysis, initial analyses were to be conducted on the large data set obtained from children participating in Study 1. Then, components structures derived from these analyses were to be tested in the data set derived from Study 2.

The number of components to be extracted from each analysis would be based on inspection of scree plots of the eigenvalues produced (where the number of valid components to be extracted corresponds to the number at the which the gradient of the plot changes drastically), and the number of eigenvalues greater than one. Judging how items load onto the extracted components would be aided by the use of varimax rotation. Items would be allocated to a component if they had a high loading on that particular component (e.g. a loading of at least .4), and a low loading on the other components (e.g. a loading less than .4). Items that loaded highly on more than one component would be discarded. Components would be discarded if they were found to comprise only one or two items. Components would be re-examined if they were

found not to possess satisfactory internal reliability in both the Study 1 and Study 2 samples, or if the component loadings were not replicated in the Study 2 sample. An internal reliability greater than .70 is considered to be necessary when devising a measure (Kline, 1993).

4.1.1 Memory modality questionnaire (MMQ)

The MMQ was designed to assess the quality of children's and adolescents' memories of, in Study 1, the most frightening recent memory they could recall, or in Study 2, the assault or RTA that caused them to attend King's College Hospital A&E. The items of the MMQ examined several different aspects of memories of trauma, as proposed in the models of Brewin et al. (1996) and Ehlers and Clark (2000): the extent to which memories consisted of sensory information (i.e. consisted of visual, auditory, olfactory, and proprioreceptive data), and the extent to which the memories comprised verbal information.

4.1.1.1 Assumptions of Principal Components Analysis

Inspection of the correlation matrix for the items of the MMQ as completed by children participating in Study 2 indicated that there was no multicollinearity or singularity between the items. Several items were found to demonstrate skewness and kurtosis. While this failure to achieve the assumption of normality for some of the items may lead to some degradation of any principal components analysis solution, it does not result in the solution ceasing to be worthwhile (Tabachnick and Fidell, 1996). Logarithmic and inverse transformations of the item score did not alter any subsequent solutions.

4.1.1.2 Component extraction

The first principal components analysis, conducted on the Study 1 data set, revealed that the items of the MMQ had four components with eigenvalues larger than one.

When subjected to a varimax rotation, it was clear that the third and fourth components had only one or two items loading highly on them. The analysis was therefore repeated, but with these items (2, 12, and 14) deleted (see Table 4.1 for contents of these items). This analysis resulted in a solution with three components with eigenvalues greater than one. However, inspection of the scree plot for this solution indicated that a two component solution may be more appropriate. The analysis was therefore repeated again, but this time the remaining items were forced into a two component solution.

The first component accounted for 30.1% of variance in the solution, while the second component account for an additional 12.3% of variance. The items included in this solution and their respective component loadings are shown in Table 4.1.

Each component appeared to posses face validity. The first component corresponded to the visual clarity of trauma memories. The second component corresponded to memories that were more fragmented and comprised non-visual sensory modalities. The internal reliability of the first component, as assessed within the Study 1 sample, was acceptable (Cronbach's alpha = .73) according to the commonly accepted limits for internal reliability estimates (Kline, 1993), while the internal reliability of the second component was less satisfactory (Cronbach's alpha = .63).

An attempt to replicate this component structure in the data for participants in Study 2 was unsuccessful. However, each component, as defined using the principal components solution derived from the Study 1 data, did have good internal reliability; for component one Cronbach's alpha was equal to .74, and for component two Cronbach's alpha was equal to .74. Given the lack of internal reliability of component 2, the difficulty of replicating the component structure observed in Study 1 data in Study 2 data, and the results of exploratory analyses where single component solutions were successfully forced into principal component analyses, it was decided to collapse the two proposed components into a single measure. This 11-item measure

had high internal reliability in both the Study 1 (Cronbach's alpha = .76) and Study 2 (Cronbach's alpha = .82) data.

Table 4.1 Component loadings of MMQ for Study 1 participants

Item	Component 1	Component 2
Component 1 (visual clarity):		
1. My memories of the frightening event are mostly pictures or images.	.71	-
8. I remember the frightening event as a few moments, and each moment is a picture in my mind.	.57	-
9. My memories of the frightening event are like a film that plays over and over.	.62	-
10. My memories of the frightening event are very clear and detailed.	.69	-
11. Remembering what happened during the frightening event is just like looking at photographs of it in my mind.	.73	-
Component 2 (Non-verbal and non-visual quality)		
3. I can't seem to put the frightening event into words.	-	.50
4. When I have memories of what happened I sometimes hear things in my head that I heard during the frightening event.	-	.58
5. When I remember the frightening event I feel like it is happening right now.	-	.71
6. When I think about the frightening event I can sometimes smell things that I smelt when the frightening event happened.	-	.42
7. I can talk about what happened very easily.	-	-.46
13. When memories come to mind of what happened, I feel my body is in the same position as when the frightening event occurred.	-	.72
Excluded items:		
2. When I think about the frightening event it is just like thinking about anything else that has happened to me.	-	-
12. I can remember the order in which things happened during the frightening event.	-	-
14. My memories of the frightening event feel like memories of other things that have happened to me that aren't very scary.	-	-

Note. MMQ = Memory Modality Questionnaire.

4.1.2 Thought Control Questionnaire – child version (cTCQ)

A child version of the Thought Control Questionnaire (TCQ; Davies & Wells, 1994) was devised. The original questionnaire devised for adults was designed to assess strategies for controlling unpleasant and unwanted thoughts that are a prominent feature of several anxiety disorders, and has been used to identify maladaptive thought control styles in adults with depression and PTSD (Reynolds & Wells, 1999). All 30 items of the TCQ were included in the child version devised for this investigation, and were amended so as to be understood by this younger population. In addition, the introduction to the measure and each item was amended so that explicit reference was made to unpleasant and unwanted memories, as well as unpleasant and unwanted thoughts.

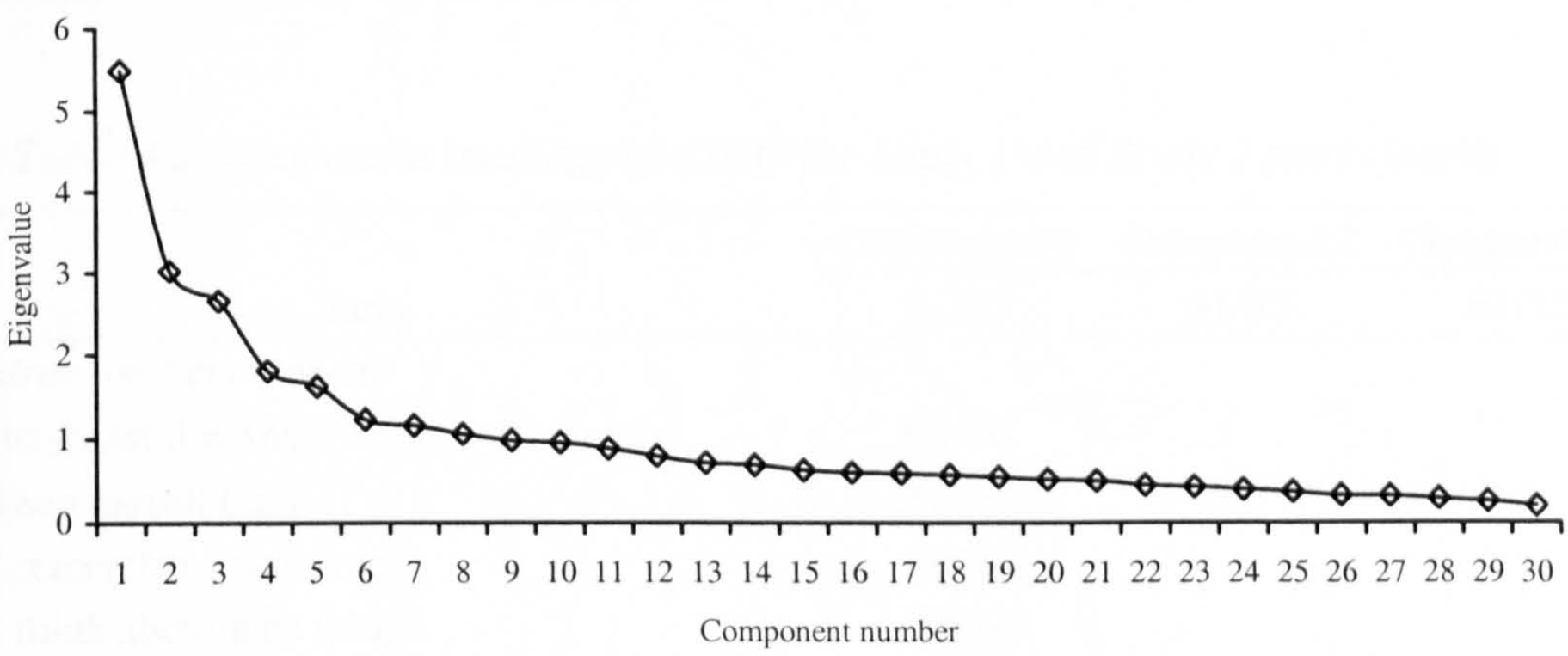
4.1.2.1 Assumptions of Principal Components Analysis

Inspection of the correlation matrix for the items of the cTCQ as completed by children participating in Study 1 indicated that there was no multicollinearity or singularity between the items. The items were not found to possess normality however, as a large proportion of items were found to demonstrate skewness and kurtosis. While this may lead to some degradation of principal components analysis solution, it does not result in the solution ceasing to be worthwhile (Tabachnick and Fidell, 1996). Logarithmic and inverse transformations of the item score did not alter any subsequent solutions.

4.1.2.2 Component extraction

The items of the cTCQ were submitted to principal components analysis. Eight components were found to have eigenvalues greater than 1. Examination of the scree plot of eigenvalues was difficult to interpret (see Figure 4.1), so it was decided to progress using an eight component solution.

Figure 4.1 Scree plot of initial principal components analysis solution for cTCQ scores



The loadings of this eight component solution were subjected to a varimax rotation. The eighth component was found to have only a single item (item 17). The analysis was therefore repeated, but with this item removed and with a seven component solution forced. The rotated solution comprised components that each had face validity, however not all of the seven components were found to have satisfactory internal reliability, i.e. Cronbach's alpha coefficients greater than .70 (Kline, 1993). A further principal components analysis was therefore conducted, but with the items that loaded on the components with poor internal reliability removed. As only three components had satisfactory internal reliability, a three component solution was forced using the 15 items that had been found to load on these components. The three components extracted from this analysis accounted for 52.8% of variance in the solution. Each item loaded satisfactorily highly on a single component (i.e. a loading greater than .50), and lowly on the other components.

The first component related to methods of pleasant or neutral distraction, and had high internal reliability (Cronbach's alpha = .81). The second component related to reappraising a thought or memory, and had an acceptable internal reliability (Cronbach's alpha = .71). The third component related to support from friends in coping with an unpleasant thought or memory, and also had acceptable internal reliability (Cronbach's alpha = .73).

Table 4.2 Component loadings of cTCQ for Study 1 and Study 2 participants

	Component 1	Component 2	Component 3
Item	S1/S2	S1/S2	S1/S2
"Distraction" component:			
4. I do something that I enjoy.	.69/.61		
8. I keep myself busy.	.68/.61		
11. I remember good times.	.69/.63		
18. I think about nice things.	.79/.61		
22. I think about something else.	.67/.48		
25. I try and do something around the house.	.54/.18		
27. I try to come up with a better thought or memory.	.66/.31		
"Reappraisal" component:			
1. I try to think clearly about the thought or memory.		.70/.37	
3. I concentrate on the thought or memory.		.77/.35	
24. I try a different way of thinking about it.		.65/.58	
28. I try to see if the thought or memory is really true.		.68/.67	
29. I wonder why I am having the thought or memory.		.51/.70	
"Social support" component:			
2. I ask my friends if they have thoughts or memories like mine.			.77/.71
6. I find out how my friends deal with these thoughts or memories.			.79/.75
15. I talk to a friend about the thought or memory.			.80/.61

Note. cTCQ = child version of Thought Control Questionnaire; S1 = Sample from Study 1; S2 = Sample from Study 2.

In order to verify this solution further, the retained items were also subjected to a principal components analysis in the data set obtained from Study 2. A three component solution was forced, accounting for 47.6% of variance. The items loaded moderately well on the components produced in the analysis on data from Study 2. The loadings of the 15 retained items on their respective components, in both the Study 1 and Study 2 data sets, are displayed in Table 4.2.

The internal reliabilities of these components as measured using the data from Study 2, however, were not as high as those for the data obtained from Study 1. The first component (relating to methods of pleasant or neutral distraction) had acceptable internal reliability (Cronbach's alpha = .70), while both the second component (relating to reappraising a thought or memory) and the third component (relating to support from friends in coping with an unpleasant thought or memory) had unacceptable internal reliability (Cronbach's alpha = .63 and .58, respectively). While the internal reliability coefficients for the second and third components may not reach the commonly accepted level of .70 (Kline, 1993), the finding that these components have similar loading structures across populations, and do reach an acceptable level for internal reliability within the considerably larger sample that participated in Study 1, suggests that the derived component structure may be acceptable for use in this investigation.

4.1.3 Post-traumatic Cognitions Inventory – child version (cPTCI)

The initial version of the cPTCI designed for this study comprised items from the adult PTCI (Foa et al., 1999) amended for use with children together additional items deemed suitable for children that would also address the key concepts that make up the adult PTCI. Six items included in the cPTCI to relate to very specific processes (i.e. omen formation and persistent anger), and an item that was considered to be vaguely worded (item 14, "I feel like a robot sometimes"), were not included in the following analyses, which sought to distinguish between more general forms of appraisal.

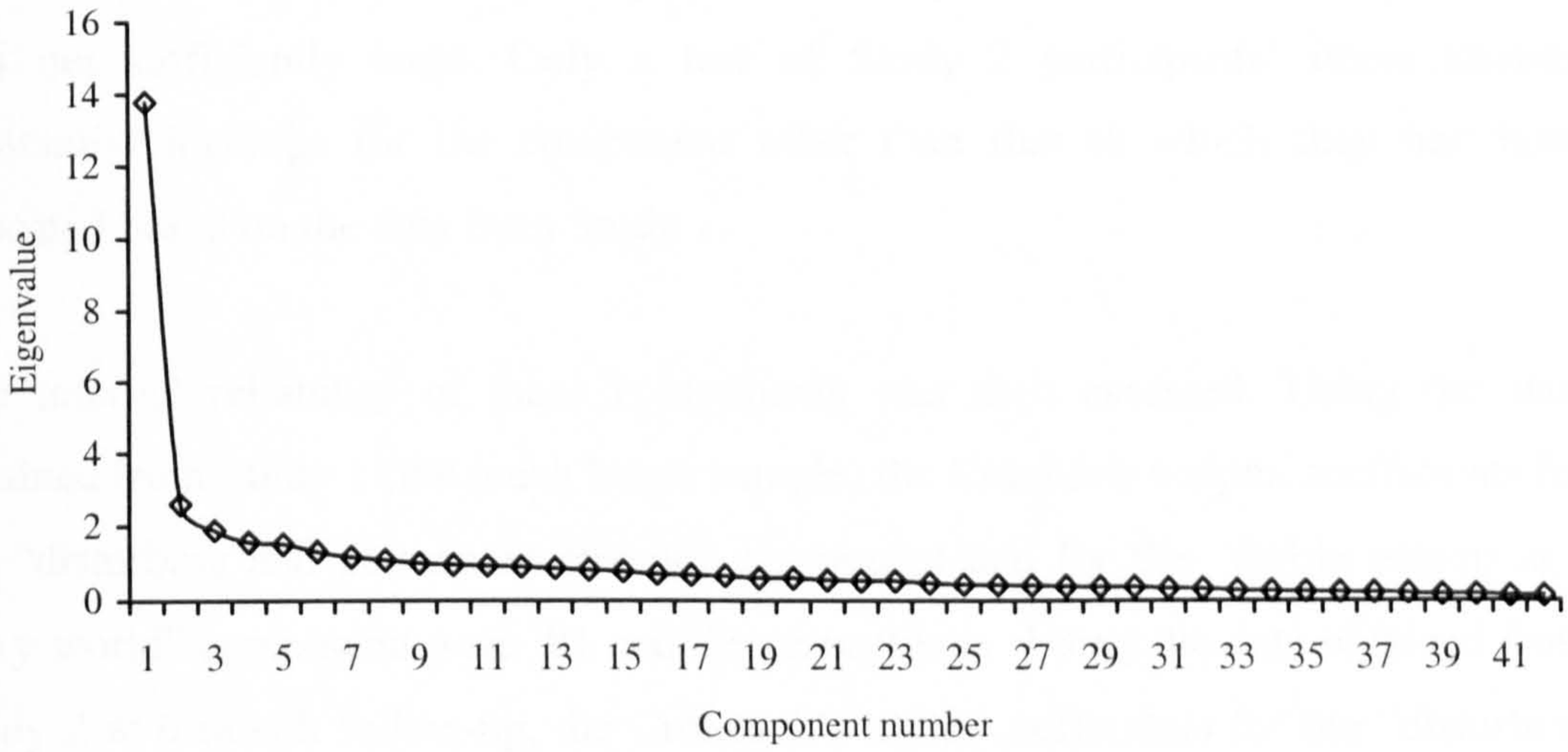
4.1.3.1 Assumptions of Principal Components Analysis

Inspection of the correlation matrix for the items of the cPTCI as completed by children participating in Study 1 indicated that there was no multicollinearity or singularity between the items. The items were not found to possess normality however; a large proportion of items were found to demonstrate skewness and kurtosis. While this may lead to some degradation of principal components analysis solution, it does not result in the solution ceasing to be worthwhile (Tabachnick and Fidell, 1996). Logarithmic and inverse transformations of the item score did not alter any subsequent solutions.

4.1.3.2 Component extraction

The 41 items of the cPTCI were submitted to a principal components analysis. Initially, a nine component model was suggested, though examination of the scree plot implied a two component solution (see fig 4.2).

Figure 4.2 Scree plot of initial principal components analysis solution for cPTCI scores



The model was run again with two components and subjected to varimax rotation. The first component accounted for 32.9% of variance, while the second component accounted for an additional 6.2% of variance. Items that were found to load more than .50 on a given component, and less than .40 on the other component were retained within the questionnaire and subjected to further interpretation. Inspection of the two proposed components, revealed meaningful groupings; the first component, comprising 13 items, corresponded to a sense of disturbing and permanent change since the trauma, while the second component, comprising 12 items, corresponded to a sense of being a feeble person in a scary world. A third principal components analysis was run with the 25 retained items, and again subjected to varimax rotation. In this solution, the first component accounted for 37.3% of variance, while the second component accounted for an additional 9.2% of variance.

In order to further verify this solution, the analysis was performed again using the data from Study 2 participants' scores on the cPTCI at the 6 month follow-up assessment. The 6 month follow-up cPTCI scores were selected as a greater number

of children and adolescents completed the questionnaire at this time point than at the 3 month follow-up. The loadings for each item on their respective components for both the Study 1 and Study 2 samples are shown in Table 4.3. It was not possible to conduct split-half confirmatory analyses as the sample size in the Study 2 population was not sufficiently large. Only a few of Study 2 participants' items showed substantial loadings for the component other than that to which they had been allocated based on the data from Study 1.

The internal reliability of these components was then assessed. Using the data obtained from Study 1 (the much larger sample) the Cronbach's alpha coefficients for the "disturbing and permanent change" component and for the "feeble person in a scary world" component were .91 and .86 respectively. Using the data obtained from Study 2 at 6 month follow-up, the Cronbach's alpha coefficients for the "disturbing and permanent change" component and for the "feeble person in a scary world" component were .88 and .88 respectively.

Within the sample taken from Study 1, total scores for each component were found to be significantly correlated ($r=.64$, $n=223$, $p<.001$). Both the "disturbing and permanent change" component and the "feeble person in a scary world" component were significantly correlated with the total score for the revised, 25 item questionnaire ($r=.88$, $n=223$, $p<.001$, and $r=.93$, $n=223$, $p<.001$, respectively).

Table 4.3 Component loadings of cPTCI for Study 1 and Study 2 participants

Item	Component 1 S1/S2	Component 2 S1/S2
"Disturbing and permanent change" component		
15. I feel like I am a different person since the frightening event.	.56/.61	
23. I used to be a happy person but now I am always sad.	.57/.49	
25. I will never be able to have normal feelings again.	.70/.82	
26. I'm scared that I'll get so angry that I'll break something or hurt someone.	.62/.55	
33. My life has been destroyed by the frightening event.	79/.57	
34. My reactions since the frightening event mean I have changed for the worse.	.76/.74	
35. My reactions since the frightening event mean I will never get over it.	.77/.63	
36. My reactions since the frightening event mean something is seriously wrong with me.	.70/.79	
37. My reactions since the frightening event show that I must be going crazy.	.63/.74	
39. Not being able to get over all my fears means that I am a failure.	.57/.61	
40. Nothing good can happen to me anymore.	.59/.49	
43. Something terrible will happen if I do not try to control my thoughts about the frightening event.	.59/.64	
45. The frightening event has changed me forever.	.67/.54	
"Feeble person in a scary world" component		
2. Anyone could hurt me.		.66/.67
3. Bad things always happen.		.68/.58
4. Everyone lets me down.		.65/.61
5. I am a coward.		.57/.68
8. I am no good.		.52/.60
9. I can't cope when things get tough.		.58/.80
10. I can't stop bad things from happening to me.		.67/.53
13. I don't trust people.		.69/.67
18. I have to be really careful because something bad could happen.		.67/.50
19. I have to watch out for danger all the time.		.53/.54
31. Life is not fair.		.51/.44
41. Small things upset me.		.55/.69

Note. cPTCI = child version of Post-Traumatic Cognitions Inventory; S1 = Sample from Study 1; S2 = Sample from Study 2.

4.2 Novel measures used only in Study 2

Several measures adapted for use with the children and adolescents participating were taken directly from adult measures and were only completed by participants in Study 2. Rather than conducting principal components analyses so as to ascertain their usefulness as instruments, it was considered sufficient to conduct internal reliability analyses of these measures. The results of these analyses are given in the following sub-sections.

4.2.1 Response Styles Questionnaire (RSQ)

The child version of the 21-item rumination sub-scale of the RSQ (Nolen-Hoeksema, 1991), adapted for use in Study 2, was completed by 79 children and adolescents at the initial (2-4 week) assessment of that study. This adapted measure was found to possess excellent internal reliability (Cronbach's alpha = .93). The mean total score for this measure was 36.68 (standard deviation = 11.67).

4.2.2 Meta-Cognitions Questionnaire (MCQ; positive beliefs about worry sub-scale)

The child version of the 19-item positive beliefs about worry sub-scale of the MCQ (Cartwright-Hatton & Wells, 1997), adapted for this study, was completed by 81 children and adolescents at the initial (2-4 week) assessment of Study 1. This adapted measure was found to possess excellent internal reliability (Cronbach's alpha = .90). The mean total score for this measure was 34.45 (standard deviation = 10.46)

4.2.3 Attitudes towards Emotional Expression questionnaire (AEE)

The child version of the AEE (Joseph et al., 1994) was completed by 88 children and adolescents at the initial assessment of Study 1. However, this 4-item adapted measure was not found to possess acceptable internal reliability (Cronbach's alpha =

.49). The removal of one item indicated by the reliability analysis as being poorly correlated with the questionnaire's total score did not adequately improve the questionnaire's internal reliability (Cronbach's alpha = .50). It was decided to include the questionnaire in later analyses, while exercising caution regarding its usefulness. The mean total score for this measure was 10.48 (standard deviation = 2.56).

4.3 Summary and Discussion

The psychometric properties of several novel measures for assessing aspects of children's and adolescents' coping with traumatic events were evaluated in two samples: the first, a cross-sectional sample of secondary school pupils; and the second, a prospective study of children and adolescents exposed to assaults and RTAs. Three of these measures (the MMQ, the cTCQ, and the cPTCI) were evaluated in both samples, while a further three, which were more simple, single-component questionnaires adapted for use with children and adolescents (the RSQ, the MCQ positive beliefs sub-scale, and the AEE), were only evaluated within the prospective study sample.

Principal components analysis initially revealed that the MMQ possessed a two component structure when assessed within the cross-sectional study sample (Study 1), the first component relating to the extent to which children's memories of a frightening event consisted of visual elements, and the second relating to the extent to which memories of the event were in a non-verbal form and consisted of non-visual elements (e.g. olfactory and auditory elements). Since the same component structure was not found in the prospective study sample (Study 2), and the second component was not found to have acceptable internal reliability in the cross-sectional study sample (Study 1), the two components were merged. That two components were found to exist only in the cross-sectional sample may have been related to the range of experiences reported by participants in this study; events that were more saddening than fearful may have led to the onset of intrusive memories laden with visual

elements, but without the features associated with more severe, PTSD-inducing events, such as the incorporation of other sensory elements and less verbal encoding.

The cTCQ was found to possess a three component structure (consisting of "distraction", "reappraisal" and "social support" components), that was reliable across the two samples tested. The "worry" and "punishment" sub-scales found in the adult version of this measure, the TCQ, were not found to be coherent concepts within the present studies.

The cPTCI was reduced from comprising 41 items to a 25 item version which possessed two components, that conveyed a sense of disturbing and permanent change, and a sense of being a feeble person in a scary world. Each component was found to have high internal reliability in both the Study 1 and Study 2 samples.

The child versions of the RSQ and the positive beliefs sub-scale of the MCQ, which were simplified from the adult versions for use with this younger age group, were found to possess high internal reliability. The child version of the AEE, however, had low internal reliability, suggesting that any results derived from the use of this measure are to be interpreted cautiously.

In conclusion, all the measures devised for use in this investigation, except for the child version of the AEE, were found to be satisfactory instruments, and their use in analyses investigating the role of the various processes examined by these measures is supported.

Chapter 5: Intrusive memories, post-traumatic stress symptoms, and coping processes in a non-clinical child and adolescent population (Study 1)

In this chapter the data derived from Study 1, a study of intrusive memories, post-traumatic stress symptoms, and coping processes in a non-clinical child and adolescent population, will be presented. Children and adolescents at two secondary schools completed a number of self-report questionnaires regarding the most frightening event they had experienced in the two months prior to participating in the study, the emotions the child or adolescent experienced during the event, the quantity and quality of any intrusive memories of the event, their post-traumatic stress and depressive symptomatology, their strategies for coping with intrusive memories of the event, and their appraisals of the event and its sequelae (see chapter 2 for the demographic details of the sample obtained, details of the procedures used in recruiting this sample, and details of the measures used). Participants' scores on the novel measures designed for the present investigation were derived using the components suggested by a psychometric analysis of the measures in chapter 4.

This study was undertaken to examine the prevalence and processes associated with intrusive memories of a trauma, the cardinal symptom of PTSD, in children and adolescents. Cognitive models of PTSD in adults stress the role of intrusive memories and how individuals cope with such memories in the aetiology of the disorder (Brewin et al. 1996; Ehlers & Clark, 2000). Intrusive memories of a traumatic event are thought to be quite common phenomena, but in a minority of individuals exposed to a trauma these may occur for an extended period. Within adults it has been demonstrated that laying down disorganised and sensory-based memories of a trauma has been shown to predict later PTSD (Halligan, Michael, Clark, & Ehlers, 2003), and that negative appraisals of intrusive memories (e.g. thinking that having intrusive memories is a sign that one is "going mad") are associated with the use of maladaptive thought control strategies that maintain these PTSD symptoms (Steil & Ehlers, 2000). These processes have not yet been fully evaluated within child and

adolescent populations. One way in which such processes may be investigated is through examining responses to fear provoking events in non-clinical populations.

Precedents exist for investigating psychopathology in non-clinical populations. For example, Allsopp and Williams (1996) assessed the prevalence of the kinds of intrusive thoughts that are typically found in individuals with obsessive compulsive disorder (OCD) in a sample of secondary school pupils. Unwanted intrusive thoughts were reported by 85% of the sample, and maladaptive strategies for coping with such intrusions (e.g. avoidance or neutralising) were found to be associated with conscientious, superstitious or magical beliefs about intrusive thoughts. Brewin, Christodoulides, and Hutchinson (1996) assessed the prevalence and quality of intrusive memories and thoughts in a non-clinical sample of adults, observing that intrusive memories are not confined to individuals experiencing emotional disorders such as PTSD and depression. Similarly, Reynolds & Brewin (1998) compared intrusive thoughts and memories in PTSD, depressed, and non-clinical groups, finding that intrusive memories were common in each group, though it was only in the PTSD group and to a lesser extent the depressed group that these memories possessed a "flashback" quality.

The particular aims of the present study, therefore, were to assess within a non-clinical child and adolescent population:

i. the prevalence of intrusive memories and other PTSD symptomatology following fear-provoking events;
ii. the relationship between emotions experienced during the event and memories of such events, and the frequency of intrusive memories and PTSD symptomatology;
iii. what strategies are maladaptive in coping with intrusive memories;
iv. the relationship between maladaptive coping strategies and post-traumatic appraisals;
v. the relationship of the above processes with depressive symptomatology; and
vi. the impact of age on the above processes.

Prior to examining these issues, some consideration of the events reported by children and adolescents participating in this study is necessary.

5.1 "Frightening events" reported by children and adolescents in Study 1

The frightening events reported by participants were classified by the investigator according to the type of trauma experienced. Event types which were reported by three or more participants are presented in Table 5.1, together with the numbers of participants reporting each event type.

Several points regarding these data are to be noted. Firstly, nightmares and scary films were commonly reported events. However this relatively high frequency may be due to the investigator giving these events as examples of the kinds of minor frightening events with regards to which children and adolescents might wish to complete the questionnaire battery, if they could not think of any other more serious events. Secondly, nearly 10% of the sample was unable to think of a recent frightening event that they had experienced. The scores of these participants on measures not related specifically to a frightening event (i.e. the child version of the Thought Control Questionnaire, and the Birleson Depression Self-Rating Scale) were retained and used to examine age-related differences (see section 5.3 below). Participants not reporting a frightening event did not complete the measures specifically related to a frightening event, (e.g. the Revised Impact of Event Scale, child version), and so did not contribute to any of the other analyses. Thirdly, some of the events reported by participants were not events that might be described as primarily fear provoking events, but rather sadness or worry provoking (e.g. family problems, exam failure). Fourthly, witnessing or being involved in an RTA, the event type most commonly reported by participants, may have been reported at an exaggerated rate due to the numbers of sixth formers at School A who were learning to drive, and an incident at School B (where one pupil was knocked down by a car when leaving school) which was witnessed by a large number of pupils. Fifthly, the

small numbers of participants reporting most types of events precludes the use of chi-square analyses to discern if there are age-related differences in the frequency with which these events are reported.

Table 5.1 Frequency of participants reporting each frightening event type

Trauma type	Frequency (N=254)	%
Witnessed or involved in an RTA	51	20.1
Illness or injury of other person (actual or threatened)	22	8.7
Burgled, or threat of burglary	15	5.9
Attacked or threat of attack by or exposure to animal	13	5.1
Attacked or threat of attack	12	4.7
Scary film	12	4.7
Bereavement	11	4.3
Stalked, pursued, or unwanted advances	10	3.9
Nightmare	9	3.5
Bullying	7	2.8
Family problems	7	2.8
Accidental Injury	5	2.0
Scared about own health	4	1.6
Lost, trouble getting home	4	1.6
Arrested by police	4	1.6
Witnessed violence	4	1.6
Fall	3	1.2
Ghost sighting/fear	3	1.2
Surgical procedure	3	1.2
exam failure/concern over future prospects	3	1.2
Other (reported by less than 3 participants)	29	11.4
No event reported	23	9.1

5.2 The prevalence of intrusive memories and other PTSD symptomatology following fear-provoking events

The frequency with which participants reported experiencing intrusive memories of the frightening event they reported are displayed in Table 5.2. Across the sample as a whole, it was more likely that children and adolescents would experience at least one

intrusive memory of the frightening event they reported than experience no intrusive memories at all. Very frequent intrusive memories (i.e. five or more times a week) were only reported by 22 participants, less than 10% of the total number of the 231 participants who reported a frightening event. Chi-square analysis revealed there to be no differences between the different age groups with regards to the frequency with which they reported experiencing intrusive memories.

Table 5.2 Frequency of intrusive memories by age group

Frequency of intrusive memories	Age group				Total (n=231)
	11-12 Years (n=70)	13-14 Years (n=59)	15-16 Years (n=34)	Sixth formers (n=68)	
Not at all / only one time	16	22	8	15	61
Once a week or less / once in a while	26	19	16	36	97
2 to 4 times a week / half the time	19	12	8	12	51
5 or more times a week / almost always	9	6	2	5	22

5.3 Mean scores on self-report questionnaires used in Study 1

Before examining the relationships between the various measures used in the study, some consideration of the mean scores for these measures, as well as comparison across the age groups, schools and sexes, and between this population and other populations, is warranted. Mean scores and standard deviations for each measure, differentiated by age group, sex, and school, are displayed in Table 5.3[2].

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[2] The data presented in Table 5.3 were obtained from the 231 participants who reported a frightening event (out of a total of 254 participants). In addition, 3 of the 23 participants who reported no frightening events completed the non-trauma related questionnaires (the cTCQ and the BDSRS). A total of 234 participants who completed at least these measures is reported, though this dropped to 231 for the variables pertaining emotions experienced during the trauma and intrusive memories of the trauma, the MMQ, the difficulty in getting rid of intrusive memories item, the thought suppression and distraction items, the RIES-C and the cPTCI.

Table 5.3 Mean scores on self-report measures by age group, sex, and school

Measure	Age group M (SD)				Sex M (SD)		School M (SD)		Total Sample (n=234) M (SD)
	11-12 Year Olds (n=72)	13-14 Year Olds (n=60)	15-16 Year Olds (n=34)	Sixth Formers (n=68)	Female (n=137)	Male (n=97)	A (n=113)	B (n=121)	
Age	11.82[a] (.30)	13.76[b] (.41)	15.67[c] (.48)	17.23[d] (.68)	14.56 (2.18)	14.30 (2.22)	15.57[a] (2.22)	13.41[b] (1.58)	14.45 (2.20)
Emotions during event:									
"Scared"	6.72 (2.36)	6.53 (2.50)	6.62 (2.31)	6.62 (2.16)	7.10[a] (2.09)	5.96[b] (2.47)	6.71 (2.09)	6.55 (2.52)	6.63 (2.32)
"Sad"	4.49 (3.53)	4.32 (3.45)	5.00 (3.55)	3.79 (2.98)	4.56 (3.45)	3.98 (3.21)	4.19 (3.23)	4.43 (3.49)	4.32 (3.36)
"Angry"	3.55 (2.78)	3.59 (3.09)	4.68 (3.39)	3.79 (3.00)	3.50 (2.86)	4.22 (3.21)	3.85 (2.99)	3.75 (3.06)	3.80 (3.02)
"Ashamed"	2.61 (2.42)	2.67 (2.79)	1.97 (2.23)	3.03 (2.73)	2.47 (2.46)	2.92 (2.75)	3.11[a] (2.85)	2.23[b] (2.24)	2.66 (2.59)
"Helpless"	4.56[a] (.36)	5.03 (.40)	5.24 (.53)	6.29[b] (.37)	5.59 (3.07)	4.84 (3.19)	6.11[a] (2.89)	4.51[b] (3.17)	5.28 (3.14)
Emotions during intrusive memories:									
"Scared"	4.70 (2.88)	4.21 (2.84)	3.70 (2.60)	3.79 (2.84)	4.82[a] (2.78)	3.26[b] (2.64)	3.94 (2.72)	4.39 (2.92)	4.17 (2.83)
"Sad"	3.67 (3.33)	3.71 (3.23)	3.54 (2.87)	3.44 (3.03)	3.73 (3.22)	3.40 (3.02)	3.58 (3.16)	3.61 (3.12)	3.59 (3.13)

Note: Superscript letters indicate sub-groups that are significantly different, as assessed by Tukey post-hoc comparisons. In the case of sex and school groupings, which only possess two sub-groups, Tukey post-hoc comparisons are unnecessary, and superscript letters indicate differences identified by ANOVA.

Table 5.3 Mean scores on self-report measures by age group, sex, and school - cont.

Measure	Age group				Sex		School		Total Sample (n=234)
	11-12 Year Olds (n=72)	13-14 Year Olds (n=60)	15-16 Year Olds (n=34)	Sixth Formers (n=68)	Female (n=146)	Male (n=102)	A (n=120)	B (n=128)	
Emotions during intrusive memories: (cont.)									
"Angry"	3.49 (2.72)	3.31 (2.85)	4.21 (3.24)	3.69 (3.04)	3.53 (2.88)	3.73 (3.00)	3.62 (2.97)	3.60 (2.89)	3.61 (2.92)
"Ashamed"	2.33 (2.36)	2.68 (2.95)	1.64 (1.41)	2.54 (2.42)	2.31 (2.33)	2.49 (2.61)	2.67 (2.58)	2.10 (2.29)	2.38 (2.45)
"Helpless"	3.96 (3.09)	3.41 (2.89)	3.32 (3.03)	3.90 (3.10)	4.04[a] (3.03)	3.24[b] (2.98)	4.15[a] (3.07)	3.29[b] (2.94)	3.71 (3.03)
"Crazy"	1.96 (1.90)	2.51 (2.42)	2.59 (2.88)	2.24 (2.20)	2.28 (2.28)	2.27 (2.31)	2.30 (2.27)	2.25 (2.32)	2.27 (2.29)
"Confused"	3.90 (3.15)	3.40 (2.93)	2.47 (2.45)	3.06 (2.82)	3.65[a] (3.07)	2.83[b] (2.65)	3.27 (2.92)	3.35 (2.94)	3.31 (2.93)
MMQ	27.41[a] (5.26)	25.25 (6.62)	23.58[b] (6.53)	23.88[b] (6.02)	26.75[a] (6.07)	23.18[b] (5.78)	24.98 (6.24)	25.56 (6.17)	25.28 (6.20)
Difficulty getting rid of intrusive memories	6.29[a] (2.63)	5.09 (2.74)	6.20 (3.02)	4.77[b] (2.90)	5.85[a] (2.73)	5.07[b] (2.99)	5.07[a] (2.78)	5.96[b] (2.88)	5.53 (2.86)
Thought suppression item	2.75 (1.09)	2.71 (1.11)	2.35 (1.04)	2.54 (1.09)	2.79[a] (1.06)	2.38[b] (1.09)	2.61 (1.09)	2.63 (1.10)	2.62 (1.09)
Distraction item	3.10 (1.13)	3.11 (1.11)	2.73 (1.11)	2.87 (1.03)	3.16[a] (1.01)	2.71[b] (1.17)	3.00 (1.06)	2.96 (1.13)	2.98 (1.10)

Note: MMQ = Memory Modality Questionnaire. Superscript letters indicate sub-groups that are significantly different, as assessed by Tukey post-hoc comparisons or ANOVA is the grouping has only two sub-groups.

Table 5.3 Mean scores on self-report measures by age group, sex, and school - cont.

Measure	Age group				Sex		School		Total Sample (n=234)
	11-12 Year Olds (n=72)	13-14 Year Olds (n=60)	15-16 Year Olds (n=34)	Sixth Formers (n=68)	Female (n=146)	Male (n=102)	A (n=120)	B (n=128)	
cTCQ distraction	18.48[a] (4.87)	16.87 (4.87)	15.85[b] (4.60)	17.94 (3.85)	18.35[a] (4.63)	16.30[b] (4.36)	18.11[a] (4.13)	16.88[b] (5.01)	17.49 (4.62)
cTCQ reappraisal	9.69 (3.35)	9.32 (3.44)	9.51 (3.65)	9.96 (2.46)	9.70 (3.07)	9.55 (3.35)	9.90 (2.79)	9.38 (3.52)	9.64 (3.18)
cTCQ social support	4.68 (1.59)	4.89 (1.95)	4.38 (1.80)	5.19 (2.13)	5.16[a] (2.06)	4.38[b] (1.52)	5.16[a] (2.02)	4.52[b] (1.71)	4.84 (1.89)
RIES-C intrusion	8.55 (5.18)	7.39 (5.53)	8.54 (5.65)	8.34 (5.26)	8.98[a] (5.34)	7.14[b] (5.20)	8.27 (5.14)	8.13 (5.57)	8.20 (5.35)
RIES-C avoidance	10.73[a] (5.28)	7.38[b] (5.24)	6.78[b] (6.03)	6.81[b] (5.69)	9.10[a] (5.63)	6.82[b] (5.68)	7.78 (5.78)	8.47 (5.72)	8.13 (5.75)
RIES-C arousal	7.30 (5.66)	7.91 (6.30)	8.25 (6.90)	7.52 (6.47)	8.59[a] (6.37)	6.42[b] (5.83)	7.46 (6.34)	7.86 (6.13)	7.66 (6.23)
RIES-C total	26.60 (13.08)	22.93 (14.72)	23.49 (15.96)	22.59 (15.01)	26.81[a] (14.37)	20.30[b] (13.99)	23.62 (14.79)	24.44 (14.35)	24.03 (14.54)
BDSRS	8.60 (5.50)	8.17 (6.01)	7.50 (5.37)	8.95 (5.71)	9.23[a] (5.84)	7.35[b] (5.26)	8.49 (5.70)	8.34 (5.65)	8.41 (5.66)
CPTCI "disturbing & permanent change"	16.82 (5.71)	16.86 (6.52)	16.78 (6.47)	15.34 (3.80)	16.83 (6.04)	15.73 (4.74)	16.08 (4.97)	16.72 (6.18)	16.37 (5.56)
CPTCI "feeble person in a scary world"	20.74 (6.70)	20.23 (7.40)	20.16 (7.70)	21.85 (7.48)	22.21[a] (7.52)	18.96[b] (6.42)	21.53 (7.07)	20.09 (7.42)	20.87 (7.26)
CPTCI total	37.57 (11.35)	37.09 (12.98)	36.94 (12.59)	37.19 (10.42)	39.04[a] (12.20)	34.68[b] (10.26)	37.61 (10.97)	36.81 (12.35)	37.24 (11.61)

Note: cTCQ = child version of Thought Control Questionnaire, RIES-C = Revised Impact of Event Scale, child version, BDSRS = Birleson Depression Self-rating Scale, cPTCI = child version of Post-traumatic Cognitions Inventory. Superscript letters indicate sub-groups that are significantly different, as assessed by Tukey post-hoc comparisons or ANOVA is the grouping has only two sub-groups.

Many of the variables displayed in Table 5.3 were found to be significantly skewed in either a positive or negative direction. Where these skewed variables were included in correlational analyses, non-parametric (Kendall's tau) as well as parametric (Pearson's r) tests were performed to examine whether skew distorted the results. Any differences between these two tests are reported in footnotes.

ANOVA tests revealed significant age group differences for feeling helpless during the event item ($F=3.92$, $df=3, 229$, $p<.01$), MMQ scores ($F=3.01$, $df=3, 250$, $p<.05$), the difficulty in "getting rid of" intrusive memories item ($F=4.45$, $df=3, 222$, $p<.01$), scores on the cTCQ distraction sub-scale ($F=3.36$, $df=3, 241$, $p<.05$), and scores on the RIES-C avoidance sub-scale ($F=7.54$, $df=3, 227$, $p<.001$). Tukey post-hoc comparisons were conducted, and significant between group differences are indicated in the table.

Eleven to 12 year old participants scored higher than all older participants on the avoidance sub-scale of the RIES-C. The youngest group was also more likely to endorse distraction as a way of coping with intrusive memories (relative to the 15-16 year olds), have greater difficultly in getting rid of intrusive memories (relative to the sixth formers), and have more sensory-based, poorly verbalised and fragmented memories (relative to the 15-16 year olds and the sixth formers). Sixth formers were more likely to have experienced helplessness during the event they reported, relative to 11-12 year olds. When a Bonferroni correction was made to account for the use of multiple comparisons, only the difference on the avoidance sub-scale of the RIES-C remained significant. However, given that the differences that existed prior to the Bonferroni correction seemed to be between the younger and older groups, and in the case of the difference on the cTCQ measure the difference mirrors that observed on the avoidance sub-scale of the RIES-C, these findings are noteworthy.

ANOVA tests revealed significant sex differences for feeling scared during the reported event ($F=14.50$, $df=1, 232$, $p<.0001$), feeling scared ($F=18.23$, $df=1, 228$, $p<.0001$), confused ($F=4.40$, $df=1, 228$, $p<.04$), and helpless ($F=3.95$, $df=1, 230$,

p<.05) during intrusive memories of the reported event, MMQ scores (F=20.56, df=1, 233, p<.0001), difficulty getting rid of intrusive memories (F=4.17, df=1, 224, p<.04), the thought suppression item (F=8.11, df=1, 228, p<.0001), the distraction item (F=8.99, df=1, 228, p<.0001), the cTCQ distraction sub-scale (F=12.84, df=1, 243, p<.001), the cTCQ social support sub-scale (F=10.47, df=1, 243, p<.001), RIES intrusion (F=6.85, df=1, 229, p<.009), avoidance (F=9.15, df=1, 229, p<.003), and arousal (F=6.90, df=1, 225, p<.009) sub-scales and the RIES total score (F=11.80, df=1, 228, p<.001), BDSRS (F=6.59, df=1, 238, p<.01), and the cPTCI "feeble person in a scary world" sub-scale (F=11.36, df=1, 221, p<.001) and cPTCI total score (F=7.83, df=1, 221, p<.006).

Girls participating in the study were more scared during the reported event, were more scared, helpless, and confused during intrusive memories of the reported event, possessed more sensory-based and fragmented memories of the event, had greater difficulty "getting rid of" intrusive memories of the event, were more likely to use thought suppression and distraction as ways of coping with intrusive memories of the event, were more likely to use distraction and social support in general when coping with intrusive thoughts and memories, experienced greater PTSD (as assessed by all RIES-C sub-scales and the RIES-C total) and depressive symptomatology, and were more likely to endorse a view of themselves as being "a feeble person in a scary world", relative to boys. When Bonferroni corrections were made to account for the use of multiple comparisons, the differences observed for the feeling scared during the reported event, feeling scared intrusive memories of the event, MMQ scores, the distraction and social support sub-scales of the cTCQ, RIES-C total score, and the "feeble person in a scary world" sub-scale of the cPTCI remained significant.

With regards to the schools to which participants were drawn from, children and adolescents at school A were more likely to feel ashamed (F=6.85, df=1, 230, p<.009) and helpless (F=16.09, df=1, 231, p<.0001) during the reported event, more likely to feel helpless during intrusive memories of the event (F=4.81, df=1, 230, p<.03), have less difficulty in getting rid of intrusive memories of the event (F=5.50, df=1, 224,

p<.02), and be more likely to endorse the cTCQ sub-scales of distraction (F=4.39, df=1, 243, p<.04) and social support (F=7.08, df=1, 243, p<.008). These findings may have been related, in the case of the differences between schools on the feelings of shame and helplessness, to the age-related differences noted above and School A comprising an older sample.

With regards to the level of psychopathology observed in this sample, some comparison with other populations is warranted. The level of post-traumatic stress in this sample, as assessing using the RIES-C (mean = 24.03) is only slightly lower than that of a large sample of children and adolescents exposed to civil war in Bosnia-Hercegovina (mean = 27.09; Smith, et al. 2001). Participants within Study 2 who completed the RIES-C two to four weeks after an assault or an RTA scored higher than the sample in Study 1 on this measure (mean = 30.88), while at six months post-trauma their mean score had dropped to a level lower than that observed in the present cross-sectional study (mean = 21.77). Levels of depression within the sample, as assessed using the BDSRS (mean = 8.41), were slightly lower than levels in another non-clinical population (mean = 8.53; Yule, 1998) and in the cohort of children and adolescents assessed by Smith and colleagues in Bosnia-Hercegovina (mean = 9.40).

5.4 The relationship between emotions experienced during the frightening event, emotions experienced during intrusive memories of the frightening event, memory quality, intrusive memory frequency, and PTSD symptomatology

Two aspects of the relationships between emotions experienced during the frightening event, emotions experienced during intrusive memories of the frightening event, memory quality, intrusive memory frequency, and PTSD symptomatology, were examined. Firstly, the relationships between emotions experienced during the frightening event and emotions experienced during intrusive memories of the frightening event were investigated using correlational analyses. Secondly, the relationship between these emotions (both during the event itself and during intrusive

memories of the event) and the quality of trauma memories, the frequency of intrusive memories, and PTSD symptomatology were investigated, also using correlational analyses.

Table 5.4 Correlations between emotions during event and during intrusive memories

	Emotions during event					Emotions during intrusive memory						
	Scared	Sad	Angry	Ashamed	Helpless	Scared	Sad	Angry	Ashamed	Helpless	Crazy	Confused
Emotions during event:												
Scared	-											
Sad	.23**	-										
Angry	-.01	.38***	-									
Ashamed	-.05	.27***	.23**	-								
Helpless	.27***	.40***	.27***	.16*	-							
Emotions during intrusive memories:												
Scared	.54***	.34***	.07	.03	.29***	-						
Sad	.17*	.77***	.33***	.18*	.39***	.42***	-					
Angry	.08	.36***	.70***	.13*	.29***	.24**	.40***	-				
Ashamed	-.04	.32***	.20*	.72***	.13*	.06	.29***	.25**	-			
Helpless	.24**	.49***	.24**	.13*	.63***	.54***	.60***	.40***	.25**	-		
Crazy	.23**	.23**	.25**	.19*	.27***	.27***	.29***	.38***	.27***	.42***	-	
Confused	.24**	.41***	.24**	.18*	.29***	.37***	.50***	.42***	.34***	.48***	.48***	-

Note: N=227. *p<.05, ** p<.001, *** p<.0001

The correlations between emotions experienced during the frightening event and emotions experienced during intrusive memories of the frightening event are displayed in Table 5.4. Several points are to be noted. Firstly, while there are significant correlations between the various emotions experienced during the reported event, none of these correlations are very high. This suggests that the individual items were being distinguished by participants as assessing different emotions, and that individuals were more likely to experience fewer but more strong emotions during the event. Secondly, the higher correlations observed between emotions experienced during intrusive memories of the reported event suggest that a greater range of emotions may be experienced during intrusive memories. Thirdly, there were high correlations between ratings of emotion during the event reported and ratings of the same emotion experienced during intrusive memories of the event. This suggests that the emotions experienced during a frightening event remain consistent over time and are characteristics of memories of the event.

Correlation coefficients for associations between emotions experienced during the event reported and during intrusive memories, and the frequency of intrusive memories of the event and PTSD symptomatology are displayed in Table 5.5. Each emotion, whether experienced during the event or during intrusive memories of the event, was found to be significantly correlated with intrusive memory frequency and PTSD symptomatology as assessed by the RIES-C. In particular, the emotions of being "scared", "sad", and "helpless" were highly correlated with these outcomes. In most cases (except for the emotion of sadness) there was a higher correlation between the rating of the emotion during the intrusive memory and intrusive memory frequency or RIES-C score than for the rating of the emotion during the actual event and these outcomes[3]. All emotions experienced during an intrusive memory were

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[3] These apparent differences in size of correlation were examined statistically by transforming these non-normally distributed correlation coefficients (r) into normally distributed coefficients (r') using the Fisher Z_r transformation. When the respective r' coefficients were compared using z-tests, differences in correlation size were only observed between trauma- and intrusion-related "anger" and the RIES-C, and between trauma- and intrusion-related "helplessness" and intrusive memory frequency.

significantly correlated with memory quality (as assessed by the MMQ)[4], though only feeling scared, sad and helpless during the event itself were correlated with this variable, suggesting that feeling angry and ashamed were not associated with laying down sensory based and fragmented memories.

Table 5.5. Correlations between emotions experienced during the event reported and during intrusive memories, and memory quality, frequency of intrusive memories of the event, and PTSD symptomatology

Emotion	Correlation with MMQ (n=229)	Correlation with intrusion frequency (n=227)	Correlation with RIES-C total score (n=220)
Experienced during event:			
Scared	.41***	.31***	.30***
Sad	.29***	.44***	.42***
Angry	.06	.27***	.22**
Ashamed	.09	.24**	.16*
Helpless	.25**	.29***	.30***
Experienced during intrusive memory:			
Scared	.36***	.44***	.41***
Sad	.26**	.43***	.38***
Angry	.21*	.37***	.39***
Ashamed	.14*	.26***	.18*
Helpless	.31***	.47***	.40***
Crazy	.31***	.35***	.29***
Confused	.37***	.41***	.41***

Note: PTSD = Post-Traumatic Stress Disorder; MMQ = Memory Modality Questionnaire; RIES-C = Revised Impact of Event Scale, child version. *p<.05, ** p<.001, *** p<.0001

[4] When a non-parametric correlation coefficient (Kendall's tau) was calculated, the relationship between feeling ashamed during intrusive memories and the MMQ ceased to be significant.

5.5 The relationship between memory quality, thought control strategies, post-traumatic appraisals, intrusive memory frequency, and PTSD symptomatology

Correlations between memory quality (as assessed by the MMQ), thought control strategies used to cope with intrusive memories (as assessed by the thought suppression and distraction items, and the sub-scales of the cTCQ), post-traumatic appraisals (as assessed by the sub-scales of the cPTCI), intrusive memory frequency, and PTSD symptomatology (as assessed by the RIES-C) are displayed in Table 5.6.

The MMQ, the novel measure assessing the quality of children's memories of their trauma, was found to be significantly and positively correlated with both intrusive memory frequency and PTSD symptomatology as assessed by the RIES-C, as well as all the thought control strategies assessed and post-traumatic appraisals as assessed by the sub-scales of the cPTCI.

The two items assessing the use of thought suppression and distraction as ways of coping with the intrusive memories reported by participants were significantly and positively correlated with each other, but not so high as to suggest that they were addressing exactly the same process. That these items were both correlated with the distraction sub-scale of the cTCQ but not the reappraisal and social support sub-scales also supports the suggestion that they are addressing related but distinct processes. Thought suppression and distraction were both correlated with the sub-scales of the cPTCI, intrusive memory frequency, and all sub-scales of the RIES-C (in particular the avoidance sub-scale) as well as total RIES-C score. The use of thought suppression was particularly highly correlated with intrusive memory frequency, relative to the use of distraction.

Table 5.6. Correlations between memory quality, thought control strategies, post-traumatic appraisals, intrusive memory frequency, and PTSD symptomatology

				cTCQ			cPTCI			RIES-C			
	MMQ	Thought suppress item	Distract item	Dis-traction	Re-appraisal	Social support	Disturbing & permanent change	Feeble person in scary world	Intrusive memory Frequency	Intrusion	Avoidance	Arousal	Total
MMQ	-												
Thought suppression item	.32***	-											
Distraction item	.31***	.56***	-										
cTCQ:													
Distraction	.21*	.37***	.39***	-									
Reappraisal	.24**	-.03	-.03	.16*	-								
Social support	.15*	.04	.08	.22**	.33***	-							
cPTCI:													
Disturbing & permanent change	.42***	.24**	.23*	.08	.28***	.12	-						
Feeble person in scary world	.42***	.32***	.26*	.18*	.33***	.17*	.64***	-					
Intrusion memory Frequency	.40***	.59***	.22**	.10	.20*	-.03	.39***	.32***	-				
RIES-C:													
Intrusion	.58***	.31***	.27**	.25**	.38***	.19*	.50***	.50***	.55***	-			
Avoidance	.43***	.50***	.46***	.38***	.11	-.07	.31***	.39***	.34***	.52***	-		
Arousal	.48***	.30***	.23**	.17*	.40***	.16*	.55***	.64***	.44***	.64***	.51***	-	
Total	.59***	.44***	.38***	.32***	.35***	.11	.50***	.60***	.53***	.85***	.81***	.86***	-

Note: N=197. PTSD = Post-Traumatic Stress Disorder; MMQ = Memory Modality Questionnaire; cTCQ = child version of Thought Control Questionnaire; cPTCI = child version of Post-Traumatic Cognitions Inventory; RIES-C = Revised Impact of Event Scale, child version. *p<.05, ** p<.001, *** p<.0001

The sub-scales of the cTCQ, which were directed at how participants typically cope with intrusive thoughts and memories and were not specific to intrusive memories of the reported event, had more complicated relationships with the other variables examined. The distraction sub-scale of the cTCQ was not correlated with intrusive memory frequency, but was significantly positively correlated with all sub-scales of and the overall total for the RIES-C, in particular the avoidance the sub-scale. The distraction sub-scale was mildly correlated with the "feeble person in a scary world" sub-scale of the cPTCI, but not at all with the "disturbing and permanent change" sub-scale[5]. Similarly, the social support sub-scale was mildly and positively correlated with the "feeble person in a scary world" sub-scale of the cPTCI, but not at all with the "disturbing and permanent change" sub-scale, and showed no correlation with intrusive memory frequency. However, it was not correlated with either the avoidance sub-scale of the RIES-C or the RIES-C total score[6]. The reappraisal sub-scale of the cTCQ, however, was strongly positively correlated with intrusive memory frequency, RIES-C intrusion, RIES-C arousal, and RIES-C total score, and both sub-scales of the cPTCI.

Both sub-scales of the cPTCI were positively correlated with intrusive memory frequency and all sub-scales of the RIES-C as well as the RIES-C total score. Intrusive memory frequency was strongly and positively correlated with the intrusion sub-scale of the RIES-C (as would be expected given that intrusive memories are a key feature of the intrusion symptoms of PTSD), as well as the RIES-C avoidance and arousal sub-scales and the RIES-C total score.

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[5] The distraction sub-scale of the cTCQ did become significantly associated with the "disturbing and permanent change" sub-scale of the cPTCI when a non-parametric correlation analysis (Kendall's tau) was performed.

[6] The reappraisal sub-scale of the cTCQ was significantly and positively correlated with both RIES-C avoidance and the RIES-C total score when a non-parametric analysis was conducted (Kendall's tau).

5.6 The relationship between emotions experienced during the frightening event, emotions experienced during intrusive memories of the frightening event, memory quality, thought control strategies, post-traumatic appraisals, intrusive memory frequency, PTSD symptomatology, and depressive symptomatology

Some examination of the relationships between the variables investigated above in the case of intrusive memories and PTSD symptomatology as applied to depressive symptomatology is now presented. This is in order to investigate what processes are involved in the production of depressive symptomatology, in itself a serious and common response to trauma in child adolescent populations (Goenjian et al., 1995; Green, 1985; Hubbard et al., 1995; Kinzie et al., 1986; Kiser et al., 1991; Looff et al., 1995; Singer et al., 1995; Stoddard et al., 1989; Weine et al., 1995; Yehuda & McFarlane, 1995; Yule & Udwin, 1991), as well as to consider whether the processes suggested to be involved in the aetiology of PTSD within this age group are specific to this disorder or play a role in the production of other psychopathology.

Table 5.7 Correlations between emotions during event and during intrusive memories and depression

Emotion	Correlation with BDSRS (n=216)
Experienced during event:	
Scared	.23**
Sad	.31***
Angry	.21*
Ashamed	.19*
Helpless	.23**
Experienced during intrusive memory:	
Scared	.29***
Sad	.30***
Angry	.31***
Ashamed	.23**
Helpless	.29***
Crazy	.21*
Confused	.32***

Note: BDSRS = Birleson Depression Self-Rating Scale.
*p<.05, ** p<.001, *** p<.0001

The correlations between depressive symptomatology (as assessed by the BDSRS) and emotions experienced during the reported event and during intrusive memories of the reported event are displayed in Table 5.7. All emotions, whether experienced during the event itself or during intrusive memories of the event, were significantly and positively correlated with depressive affect. Sadness had the greatest correlation with BDSRS of all the emotions experienced during the reported event, while several emotions experienced during intrusive memories (i.e. feeling scared, sad, angry, helpless, and confused) were moderately strongly correlated with BDSRS. While these correlations are quite strong, they do not appear to be as strong as the correlations between these emotions and PTSD symptomatology, as displayed in Table 5.5[7].

Displayed in Table 5.8 are the correlations between intrusive memory quality (as assessed by the MMQ), thought control strategies (as assessed by the thought suppression and distraction items and the sub-scales of the cTCQ), post-traumatic appraisals (as assessed by the sub-scales of the cPTCI), intrusive memory frequency, PTSD symptomatology (as assessed by the RIES-C) and depressive symptomatology (as assessed by the BDSRS).

[7] When these apparent differences in correlation size were examined statistically, however (using the Fisher's Z_r transformation and z-test procedure, as in Footnote 3), no significant differences in correlation size were observed.

Table 5.8 Correlations between memory quality, thought control strategies, post-traumatic appraisals, intrusive memory frequency, PTSD symptomatology, and depressive symptomatology

	Correlation with BDSRS (n=208)
MMQ	.41***
Thought suppression item	.27***
Distraction item	.22*
CTCQ:	
Distraction	.02
Reappraisal	.27***
Social support	.01
cPTCI:	
Disturbing & permanent change	.67***
Feeble person in scary world	.70***
Intrusion Frequency	.40***
RIES-C:	
Intrusion	.45***
Avoidance	.32***
Arousal	.62***
Total	.55***

Note: PTSD = Post-Traumatic Stress Disorder; BDSRS = Birleson Depression Self-Rating Scale; MMQ = Memory Modality Questionnaire; cPTCI = child version of Post-Traumatic Cognitions Inventory; cTCQ = child version of Though Control Questionnaire; RIES-C = Revised Impact of Event Scale, child version.
*p<.05, ** p<.001, *** p<.0001

Depression was found to be as strongly correlated with MMQ scores as intrusion frequency was (see Table 5.6 above). The thought suppression and distraction strategies were moderately well correlated with BDSRS, while the cTCQ distraction sub-scale was not. The reappraisal sub-scale of the cTCQ and in particular the cPTCI sub-scales were positively correlated with depressive symptomatology. Indeed, the cPTCI sub-scales were correlated with depression at a rate far greater than emotions experienced during the frightening event or during intrusive memories of the

frightening event[8]. In the case of the cPTCI, the correlation between its sub-scales and the BDSRS was even greater than that between the cPTCI and the RIES-C. BDSRS scores were also significantly correlated with intrusion frequency and RIES scores[9].

5.7 Regression models of variables associated with intrusive memory frequency, PTSD symptomatology, and depressive symptomatology

In order to more fully investigate the role of emotion, memory quality, thought control strategies and post-traumatic appraisals in the aetiology of intrusive memories, PTSD symptomatology, and depressive symptomatology, regression analyses were performed to investigate the unique variance accounted for by each of these processes. The strategy adopted for entering variables into these models was as follows. Hierarchical regression analysis was selected as the mode of entering variables so as to see whether the variables entered on each step would account for unique variance over and above previous steps. Variables would be entered in the following order of steps: in the first step demographic (i.e. age and sex) variables would be entered; in the second step subjective indices of event severity (i.e. the emotions experienced during the reported event) would be entered; in the third step the memory quality variable (i.e. the MMQ) would be entered; in the fourth step the thought control strategy items and measures would be entered; and in the fifth step, the post-traumatic appraisal measures (the sub-scales of the cPTCI) would be entered.

In order to assess whether the assumptions of regression analysis were met, i.e. normality, linearity, and homoscedasticity, residuals produced by each regression were examined. These assumptions are met when there is no obvious relationship between predicted scores on the independent variable and residuals, as observed in a

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[8] These differences in the size of correlations were found to be statistically significantly when the Fisher's Z_r transformation and z-test procedure was used (see Footnote 3).

[9] These differences were also found to be statistically significant when the Fisher's Z_r transformation and z-test procedure was used (see Footnote 3).

scatterplot of these scores (Tabachnick & Fidell, 1996). All these assumptions were met in the analyses conducted in this chapter. Furthermore, regression will not work correctly if there is multicollinearity among independent variables entered in the model. Where independent variables were found to be highly correlated (Tabachnick and Fidell, 1996, recommend no higher than .9) variable selection is to be re-considered. No variables were found to be so highly correlated in the present study.

5.7.1 Regression models of variables associated with intrusive memory frequency

The variables listed in the regression modelling strategy given above were entered into a hierarchical regression model with intrusive memory frequency as the dependent variable. The significance of the model at each step and the beta coefficient for each variable entered, as measured in the final step of the model, is presented in Table 5.9.

Entering age and sex in the first sex significantly enhanced the ability of the model to account for variance in intrusive memory frequency, though beta coefficients suggest that this finding is the principally related to the role that sex plays. The inclusion of the emotions experienced during the reported event, and the memory quality variable in the model each accounted for unique variance in intrusive memory frequency, though inclusion of both thought control strategies and post-traumatic appraisals did not. The total model accounted for 37% of variance in intrusive memory frequency.

Table 5.9. Regression model of variables associated with intrusive memory frequency

	Model				Step				Beta Coefficients (Step 5)
Predictor variables entered	R^2	*F*	*df*	*p*	R^2 *change*	*F*	*df*	*p*	
Step 1: Demographic variables:	.03	3.05	2, 194	.050	.03	3.05	2, 194	.050	
Age									-.04
Sex									-.09
Step 2: Emotions experienced during event:	.30	11.65	7, 189	.001	.27	14.66	5, 189	.001	
Scared									.13^{+}
Sad									.18*
Angry									.14*
Ashamed									.14*
Helpless									.06
Step 3: Memory quality:	.33	11.75	8, 188	.001	.03	9.03	1, 188	.003	
MMQ									.18*
Step 4: Thought control strategies:	.36	7.97	13, 183	.001	.03	1.61	5, 183	.159	
Thought suppression item									-.04
Distraction item									.08
cTCQ distraction									-.02
cTCQ reappraisal									.11^{+}
cTCQ social support									-.15*
Step 5: Post-traumatic appraisals:	.37	7.08	15, 181	.001	.01	1.18	2,181	.310	
cPTCI "permanent and disturbing change"									.13
cPTCI "feeble person in scary world'									-.05

Note: MMQ = Memory Modality Questionnaire; cTCQ = child version of Thought Control Questionnaire; cPTCI = child version of Post-Traumatic Cognitions Inventory. $^{+}$p<.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

5.7.2 Regression models of variables associated with PTSD symptomatology

The variables listed in the regression modelling strategy given above were entered into a hierarchical regression model with RIES-C total score as the dependent variable. The significance of the model at each step and the beta coefficient for each variable entered as measured in the final step of the model is presented in Table 5.10. Each step (age and sex, emotions experienced during the event, memory quality, thought control strategies, and post-traumatic appraisals) significantly accounted for unique variance in the model. The total model accounted for 60% of variance in RIES-C scores.

In order to examine whether the memory quality, thought control strategies and post-traumatic appraisals accounted for variance in RIES-C over and above intrusive memory frequency, a further regression analysis was performed, but with intrusive memory frequency entered in the initial step. As the regression model above (see Table 5.9) indicated that intrusive memory frequency was strongly related to emotions experienced during the reported event, these variables were not entered in the regression. Intrusive memory frequency was entered into the first step of the new model, and accounted for 29% of variance in RIES-C scores ($F = 77.80$, $df = 1, 190$, $p<.0001$). In the second step, the addition of the MMQ significantly accounted for an additional 17% of variance ($F = 61.39$, $df = 1, 189$, $P<.0001$). In the third step thought control strategies (as assessed by the thought suppression and distraction items and the sub-scales of the cTCQ) significantly accounted for a further 12% of variance in RIES-C scores ($F = 10.18$, $df = 5, 184$, $p<.0001$), while in the fourth step scores on the cPTCI significantly accounted for an additional 5% of variance ($F = 12.17$, $df = 2, 182$, $p<.0001$). The overall model accounted for 63% of variance in RIES-C scores. In the final step of this model significant beta coefficients were observed for intrusive memory frequency (beta = .25, $t = 4.90$, $p<.0001$), the MMQ (beta = .25, $t = 4.54$, $p<.0001$), thought suppression (beta = .17, $t = 3.02$, $p<.003$), cTCQ distraction (beta = .10, $t = 2.05$, $p<.04$), cTCQ reappraisal (beta = .16, $t = 2.89$), and the 'feeble person in a scary world' sub-scale of the cPTCI (beta = .24, $t = 3.74$, $p<.0003$).

Table 5.10. Regression model of variables associated with RIES-C total

Predictor variables entered	Model				Step				Beta Coefficients (Step 5)
	R^2	*F*	*df*	*p*	R^2 *change*	*F*	*df*	*p*	
Step 1: Demographic variables:	.05	5.05	2, 185	.007	.05	5.05	2, 185	.007	
Age									.00
Sex									.00
Step 2: Emotions experienced during event:	.29	10.51	7, 180	.001	.24	12.09	5, 180	.001	
Scared									.03
Sad									.11^{+}
Angry									.09
Ashamed									-.05
Helpless									.03
Step 3: Memory quality:	.45	18.46	8, 179	.001	.16	52.92	1, 179	.001	
MMQ									.30****
Step 4: Thought control strategies:	.55	16.29	13, 174	.001	.10	7.47	5, 174	.001	
Thought suppression item									.16*
Distraction item									.08
cTCQ distraction									.10^{+}
cTCQ reappraisal									.15*
cTCQ social support									-.07
Step 5: Post-traumatic appraisals:	.60	17.03	15, 172	.001	.05	10.41	2, 172	.001	
cPTCI "permanent and disturbing change"									.10
cPTCI "feeble person in scary world'									.21**

Note: RIES-C = Revised Impact of Event Scale, child version; MMQ = Memory Modality Questionnaire; cTCQ = child version of Thought Control Questionnaire; cPTCI = child version of Post-Traumatic Cognitions Inventory. $^{+}$p<.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

5.7.3 Regression model of variables associated with depressive symptomatology

The variables listed in the regression modelling strategy given above were entered into a hierarchical regression model with depressive symptomatology (as assessed by the BDSRS) as the dependent variable. The significance of the model at each step and the beta coefficient for each variable entered as measured in the final step of the model is presented in Table 5.11.

The first step (age and sex) did not significantly contribute to the model, but all other steps, in particular the fifth and final step (post-traumatic appraisals), significantly contributed to the model, with the overall model accounting for 66% of variance in BDSRS scores.

Table 5.11. Regression model of variables associated with BDSRS

	Model				Step				
Predictor variables entered	R^2	*F*	*df*	*p*	R^2 *change*	*F*	*df*	*p*	Beta Coefficients (Step 5)
Step 1: Demographic variables:	.03	2.70	2, 187	.070	.03	2.70	2, 187	.070	
Age									.04
Sex									-.05
Step 2: Emotions experienced during event:	.16	5.02	7, 182	.001	.13	5.81	5, 182	.001	
Scared									-.02
Sad									.00
Angry									-.05
Ashamed									-.01
Helpless									.00
Step 3: Memory quality:	.23	6.69	8, 181	.001	.07	15.54	1, 181	.001	
MMQ									.10
Step 4: Thought control strategies:	.32	6.40	13, 176	.001	.09	4.81	5, 176	.001	
Thought suppression item									.04
Distraction item									.06
cTCQ distraction									-.17**
cTCQ reappraisal									.06
cTCQ social support									-.13*
Step 5: Post-traumatic appraisals:	.66	22.09	15, 174	.001	.33	84.57	2, 174	.001	
cPTCI "permanent and disturbing change"									.39****
cPTCI "feeble person in scary world'									.43****

Note: BDSRS = Birleson Depression Self-Rating Scale; MMQ = Memory Modality Questionnaire; cTCQ = child version of Thought Control Questionnaire; cPTCI = child version of Post-Traumatic Cognitions Inventory. $^{+}p<.1$, * $p<.05$, ** $p<.01$, *** $p<.001$, **** $p<.0001$

5.8 Summary and discussion

Several key issues regarding the nature of aetiology of post-traumatic stress reactions in children and adolescents were addressed by a cross-sectional study of a non-clinical population drawn from two secondary schools. How the results of this study answered the questions stated at the beginning of this chapter are summarised here.

5.8.1 What is the prevalence of intrusive memories and other PTSD symptomatology following fear-provoking events?

Regarding the prevalence of intrusive memories and other PTSD symptomatology following fear-provoking events, it was found that intrusive memories are a relatively common phenomenon following fear-provoking events, and that post-traumatic stress levels (as assessed by the RIES-C) were moderately high in the non-clinical sample assessed. While the level of post-traumatic stress was not as a high as that observed in a sample of children and adolescents exposed to civil war (Smith et al., 2001) or the Study 2 population at two to four weeks after exposure to either an assault or an RTA, the observed level of post-traumatic stress was greater than that found in the Study 2 population at six months post-trauma.

The moderately high scores on the RIES-C do not necessarily indicate that a high rate of PTSD would have been diagnosed in the sample, since this self-report measure does neglect certain PTSD symptoms (e.g. flashbacks, nightmares, emotional numbing, etc.) and may be related to distress in general rather than specifically PTSD symptomatology. A large number of events reported by the sample were undeniably distressing but would not qualify for criterion A of the DSM-IV PTSD diagnosis, supporting this latter point.

Since these data support the view that non-clinic referred children and adolescents experience aspects of post-traumatic stress that persist for at least several weeks in response to frightening events, the use of non-clinical samples to investigate processes involved in the aetiology of child and adolescent PTSD may be justified.

5.8.2 What is the relationship between emotions experienced during the event and memories of such events, and the frequency of intrusive memories and PTSD symptomatology?

With regards to the relationship between emotions experienced during the event and during memories of such events, and the frequency of intrusive memories and PTSD symptomatology, a number of significant correlations were identified. Emotions experienced during the event, in particular fear, sadness, and helplessness, were found to be related to more sensory-based and fragmented memories (as assessed by the MMQ), intrusive memory frequency, and RIES-C scores. Strong correlations were observed between MMQ scores and intrusive memory frequency and RIES-C scores.

Both emotions experienced during a frightening event and memory quality, as assessed by the MMQ, accounted for unique proportions of variance in intrusive memory frequency. Memory quality also accounted for a significant proportion of variance in RIES-C scores, over and above intrusive memory frequency, suggesting that this measure is not merely an index of intrusive phenomena but is quantifying aspects of the memories of the reported event.

The distinction between the role of emotions experienced during a frightening event and the role of the quality of memories of a frightening event, gives support for the application of significant element of the adult cognitive models of PTSD of Brewin et al. (1996) and Ehlers and Clark (2000) to the understanding of the disorder in children and adolescents. Both of these models state that the onset of PTSD is related not just to experiencing a extremely fear-provoking event (though clearly fear is essential), but to laying down poorly processed, sensory based, and fragmented memories of the event as well.

That a role for memory quality in the aetiology of PTSD was observed in a non-clinical population suggests that the formation of sensory based and fragmented memories may only be an extreme form of normal memory processes, and not qualitatively different from the processes in the formation of memories of non-

traumatic events. There still exists a need to examine whether this distinction would be observed in a sample of children exposed to traumatic events (i.e. events that would meet criterion A of DSM-IV).

5.8.3 What strategies are maladaptive in coping with intrusive memories?

Investigation of the relationships between post-traumatic stress symptomatology and potentially maladaptive thought control strategies and trauma-related appraisals identified by adult theorists, revealed a number of significant correlations. Both thought suppression and distraction items were significantly correlated with PTSD as assessed by the RIES-C. The distraction and re-appraisal sub-scales of the cTCQ were found to be significantly positively correlated with total RIES-C scores, while the social support sub-scale was unrelated to total RIES-C scores. Both the "disturbing and permanent change" and "feeble person in a scary world" sub-scales of the cPTCI were significantly correlated with scores on the RIES-C. Importantly, no thought control strategy or post-traumatic appraisals were significantly negatively correlated with post-traumatic stress symptomatology. While no thought control strategies or appraisals significantly improved the amount of variance explained in a regression model of intrusive memory frequency, these processes did significantly improve a regression model of RIES-C scores. These processes also accounted for a large proportion of variance over and above demographic variables (i.e. age and sex), which themselves accounted for very little variance in these regression models.

These findings also support the application of elements of adult cognitive models of PTSD to children and adolescents, as was noted in the previous sub-section with regards to the role of memory quality. Cognitive avoidance, a feature of both the models of Brewin et al. (1996) and Ehlers and Clark (2000), was assessed in a variety of ways (i.e. the thought suppression and distraction items, and the distraction sub-scale of the cTCQ) and found to be significantly related to post-traumatic stress in children and adolescents. The relationship between the reappraisal sub-scale of the cTCQ and PTSD symptomatology suggests that some children and adolescents attempted to amend how they view a frightening experience, but that this strategy was unsuccessful and was closer to being a form

of rumination, a process implicated strongly in the model of Ehlers and Clark (2000). Post-traumatic appraisals, also a key feature of this model, were found to play a significant role, suggesting that children and adolescents are capable of higher-level appraisals that interfere with the processing of memories of a frightening event and maintain negative affect.

5.8.4 What is the relationship between maladaptive coping strategies and post-traumatic appraisals?

With regards to the relationships between post-traumatic appraisals and thought control strategies, a varying pattern between each sub-scale of the cPTCI and each thought control strategy was observed. Both the "permanent and disturbing change" and "feeble person in a scary world" sub-scales of the cPTCI were significantly and positively correlated with scores on the individual thought suppression and distraction items. While the feeble person in a scary world sub-scale was significantly and positively correlated with each of the cTCQ sub-scales, the "permanent and disturbing change" sub-scale was only correlated with the reappraisal sub-scale of the cTCQ. These data identify a specific pathway between negative post-traumatic appraisals and PTSD that has also been found in adults (Steil & Ehlers, 2000), i.e. negatively appraising a frightening event has the result of encouraging the use of maladaptive thought control strategies, which in turn either directly worsen or maintain post-traumatic stress symptoms.

5.8.5 What is the relationship of the above processes with depressive symptomatology?

Depressive symptomatology was found to be significantly related to all emotions experienced during the report frightening event, the quality of memories of the reported event, several of the thought control strategies assessed, and in particular, post-traumatic appraisals. These variables accounted for a very large amount of variance in BDSRS scores in a regression model over and above demographic variables.

The data presented in this chapter suggest that the cognitive processes hypothesized to be involved in PTSD are also involved in depression. That post-traumatic appraisals should have a large role in producing low mood is to be expected. The finding that memory quality has a significant, if not large, role in producing depression, however, is more counter-intuitive. This suggests that the occurrence of fragmented, sensory based memories is experienced as very negative and plays a role in maintaining a low mood, or acts as a reminder of what the event child or adolescent was exposed to.

5.8.6 What is the impact of age on the above processes?

Age did not appear to make an enormous impact on the symptomatology and processes examined here. While children from the youngest age group (11-12 year olds) did report greater use of distraction as assessed by the cTCQ, and had more sensory-based and fragmented memories as assessed by the MMQ, the only impact on overall symptomatology was greater avoidance of event-related stimuli, as assessed by the RIES-C; the total RIES-C and BDSRS scores of this age group did not significantly differ from older age groups. This lack of impact of age was also observed in the regression models, where either the demographic variables added no unique variance (e.g. in the case of the BDSRS model) or beta coefficients revealed that any variance explained by the demographics variables was attributable to sex, rather than age. The failure of age to make a significant impact on the regression models conducted in this chapter suggests that the cognitive processes found in this chapter to be related to PTSD have their effect across the age groups participating in Study 1.

Chapter 6: The time course of post-traumatic stress and depressive symptomatology in children and adolescents exposed to assaults or RTAs

In this chapter the time course of post-traumatic stress, anxious, and depressive symptomatology in children and adolescents in Study 2, who were exposed to either assaults or RTAs, will be outlined. Post-traumatic stress and depressive symptoms were assessed in two ways; firstly, through semi-structured interviews at 2-4 weeks post-trauma and 6 months post-trauma, and secondly, through self-report questionnaires that were completed at 2-4 weeks, 3 months, and 6 months post-trauma. Non-specific anxiety was assessed by a self-report questionnaire at the three and six month follow up assessments, while particular anxiety disorders were assessed by semi-structured interview at the two to four week and six month time points.

Examining the time course of such psychopathology is warranted for several reasons. Firstly, as outlined in the introduction, the time course of post-traumatic stress symptoms in children and adolescents has implications for the theoretical understanding of PTSD in this age group. The application of elements of adult cognitive models of PTSD (e.g. Brewin et al., 1996; Ehlers & Clark, 2000) depends on a time course where initial post-traumatic stress is high and then decreases over time, suggesting a distinction between onset and maintenance processes.

Secondly, the ability of post-traumatic stress symptoms shortly after a trauma to predict later, chronic PTSD is of significant clinical use. In adults, the ability of post-traumatic stress symptoms, and the Acute Stress Disorder (ASD) diagnosis to predict later PTSD has been clearly demonstrated (Brewin, Andrews, & Rose, 2003; Brewin, Andrews, Rose, & Kirk, 1999). In children and adolescents there is less evidence regarding the ability of early PTSD symptoms to predict later PTSD, and no evidence at all concerning the prevalence of ASD and its ability to predict later PTSD. ASD was introduced in DSM-IV (American Psychiatric Association, 1994) so as "to distinguish between normative and pathological acute stress responses by linking acute stress disorder to predictors of a relatively poor prognosis [p.1679]" (Marshall, Spitzer, & Liebowitz, 1999). ASD differs from

PTSD in being explicitly conceived as a dissociative response to trauma (Spiegel, Koopman, Cardeña, & Classen, 1996), with the most significant diagnostic addition being the requirement that an individual experiences at least three of a possible five dissociation symptoms, either during or following a trauma. The role that these dissociation symptoms play in children's and adolescents' responses to trauma in particular requires examination.

Thirdly, evidence concerning the prevalence of post-traumatic stress following assaults is needed. While there is a growing body of evidence concerning children's and adolescents' responses to RTAs (Di Gallo, Barton, & Parry-Jones, 1997; Mirza, Bhadrinath, Goodyer, & Gilmour, 1998), very few studies regarding their responses to non-domestic violence have been conducted, and there exist no studies regarding traumatic stress responses in British youth following violent crime. The attendance of children and adolescents at Accident and Emergency departments in the UK following RTAs is not uncommon; according to the Department of Transport, Local Government and Regions (2000), over 40,000 children, aged 15 or under, are injured each year in RTAs. Violent crime is also a common occurrence for children and adolescents; the Youth Survey of 2002 found that 39% of children and adolescents had been physically attacked in the area where they lived, and 35% had been attacked while at school (MORI, 2002). Estimates of the prevalence of post-traumatic stress in children and adolescents exposed to such violence is needed to inform the provision of services for this vulnerable group.

Fourthly, greater consideration of the prevalence of other psychopathology in children and adolescents following trauma is warranted (Pynoos, Steinberg, & Piacentini, 1999). The emphasis placed on PTSD as a possible response to trauma has detracted from consideration of other forms of psychological disorder following trauma. In particular, depressive symptomatology, and the relationship of such psychopathology to post-traumatic stress symptomatology, is in need of investigation.

6.1 Acute Stress Disorder, 'early Post-Traumatic Stress Disorder', and Post-Traumatic Stress Disorder at six month follow up

In this sub-section the prevalence of ASD diagnosis and criteria as assessed at the initial, 2-4 week interview, and PTSD at the six month follow up, will be detailed. In addition, the prevalence of 'early PTSD' diagnosis and criteria (i.e. PTSD as assessed at the initial interview but without Criterion E, which requires that the diagnosis can only be made one month after a trauma) and 'sub-ASD' diagnosis and criteria (i.e. ASD without Criterion B, the dissociation symptoms) will also be presented. The frequency with which children and their parents report individual 'early PTSD' and ASD symptoms will be presented, and the ability of individual symptoms, as well as ASD, 'early PTSD' and 'sub-ASD' diagnoses and criteria, to predict PTSD at follow up will be presented. Differences between children and adolescents exposed to assaults or RTAs will be detailed.

6.1.1 The prevalence of ASD, 'early PTSD', 'sub-ASD', and PTSD at six month follow up

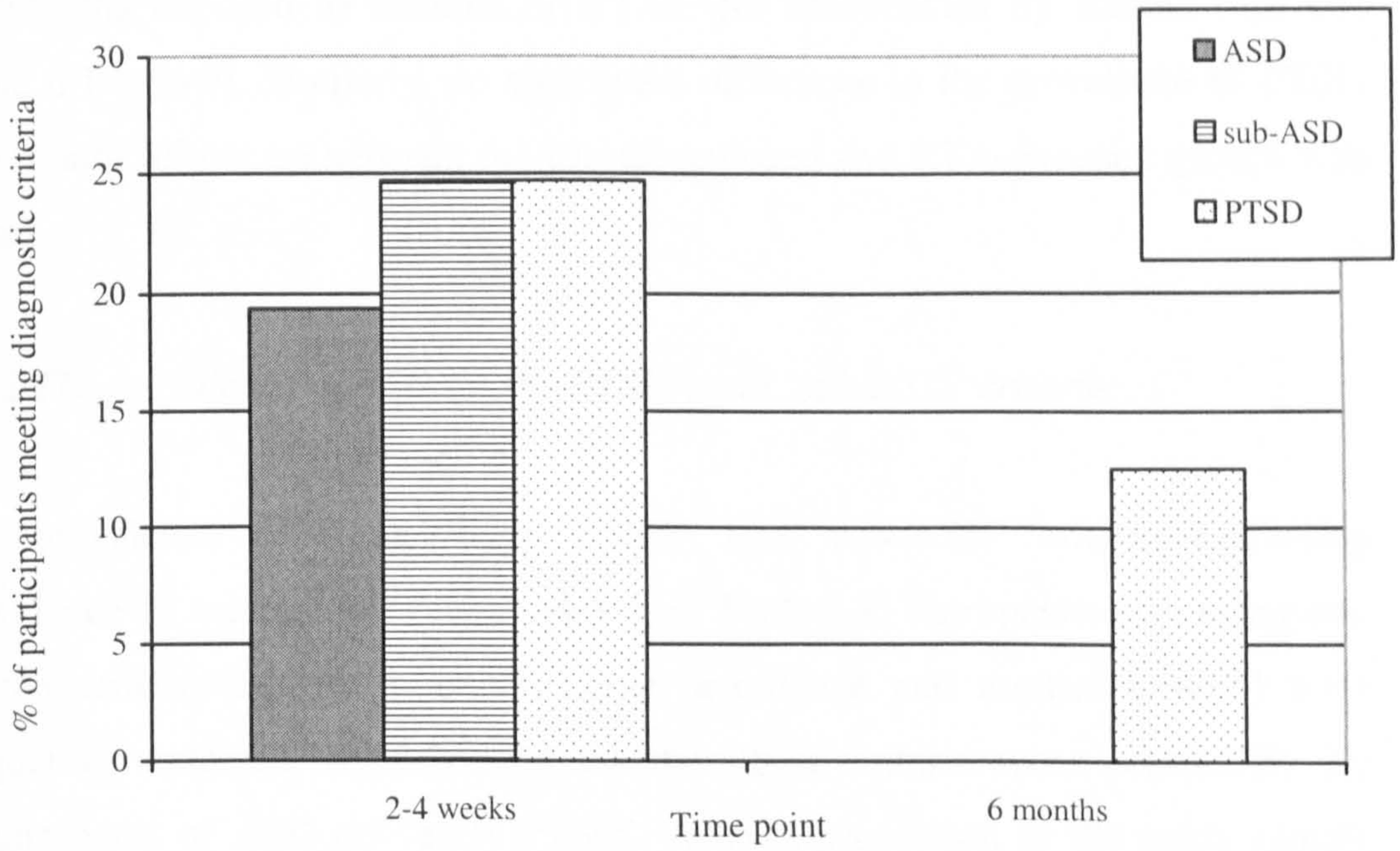
Ninety-three children and adolescents completed the initial ADIS-C interview for ASD, 'sub-ASD' and 'early PTSD', out of 106 (87.7%) who participated in the study as a whole. In 90 cases (84.9%), both child and parent completed the ADIS-C interview. At six month follow up, 64 (68.8%) of the 93 children and adolescents who completed the initial interview were re-interviewed. Of the 90 cases where both child and parent completed the initial interview, there were 51 (56.7%) cases where both child and parent were re-interviewed at six month follow up.

The internal reliability of the ASD diagnostic items was found to be high (Cronbach's alpha=0.85), and comparable to that of the 'sub-ASD' diagnosis (Cronbach's alpha=0.86), and the 'early PTSD' diagnosis (Cronbach's alpha=0.87). Tape recordings of 11 initial interviews and 10 follow up interviews were assessed by another clinician so as to assess the inter-rater reliability of the ASD and PTSD diagnoses according to the interview schedules used. The clinician (PS) had seven years' experience of assessing and treating traumatic

stress reactions in children and adolescents, and was blind as to the principal investigator's diagnosis in each case. There was unanimous agreement between raters for both the ASD diagnosis at initial interview (Kappa = 1.00) and the PTSD diagnosis at 6 month follow up (Kappa = 1.00).

According to child report as assessed using the ADIS-C, 18 (19.4%) children and adolescents met criteria for ASD at the initial interview. Twenty-three (24.7%) met criteria for 'early PTSD'. Twenty-three (24.7%) met all criteria except the dissociation symptoms criterion for ASD (hence referred to as 'sub-ASD'). At the six month follow up interview, 8 (12.5%) of the 64 children and adolescents met criteria for PTSD (see Fig 6.1 for graphical representation of how rates of ASD and PTSD changed over time).

Figure 6.1. ASD/PTSD diagnoses at two to four weeks and six months post-trauma, according to child report



Composite diagnoses were derived from parent and child reports in the interview schedules. According to these diagnoses, 24 out of 90 (26.7%) children and adolescents met criteria for ASD at the initial interview, 35 out of 90 (38.9%) met criteria for 'early PTSD', and 37 out of 90 (41.1%) met criteria for 'sub-ASD'. At

the six month follow up assessment, 11 out of 51 (21.6%) children and adolescents were found to meet criteria for PTSD, as identified using a diagnosis derived from parent and child reports.

Examination of the agreement between child and parent report on the ADIS-C, however, revealed there to be considerable disagreement between them as to the child or adolescent's post-traumatic stress reaction. Inter-rater reliability coefficients for each diagnosis were not high; Kappa coefficients for ASD, 'early PTSD' and 'sub-ASD' were .39, .28, and .42, respectively. For PTSD as assessed at six month follow up, reliability between the two reports had improved (Kappa = .71). Nevertheless, this disagreement, and the relative maturity of participants in the study, suggest that use of the composite diagnosis may not be warranted. Subsequent analyses therefore will use diagnoses derived from child reports alone.

Chi-square analyses revealed there to be no significant differences in the prevalence of ASD, 'early PTSD', or 'sub-ASD' between children and adolescents exposed to assaults or RTAs (for frequencies by trauma type see Table 6.1 below). Similarly, no significant difference in the prevalence of PTSD at 6 month follow up between the assault-exposed and RTA-exposed groups was found.

6.1.2 The prevalence of ASD, 'early PTSD', and 'sub-ASD' criteria

The prevalence of ASD, 'early PTSD' and 'sub-ASD' criteria (including prevalence by trauma type) are displayed in Table 6.1. The specifically symptom-related criteria (i.e. the re-experiencing, avoidance and arousal criteria) were frequently endorsed, regardless of whether these criteria were defined by the requirements of ASD or 'early PTSD'. A large proportion of the study sample met criteria for Criterion A (i.e. a traumatic event). However, it was noted by the investigator that the open wording of the ADIS-C questions that address this criterion, and the reluctance of many children and adolescents to admit to feeling scared or horrified, may mean that the reported figure should be higher. The criterion which was the least met was that of impairment of functioning (Criterion F).

Table 6.1. Frequency of ASD, 'sub-ASD' and 'early PTSD' criteria and diagnoses by trauma type at two to four weeks post-trauma, according to child report

	Number meeting criterion/diagnosis (%)		
Criterion/Diagnosis	Assault (*N*=52)	RTA (*N*=41)	Total (*N*=93)
ASD criteria			
A. Traumatic stressor	36 (69.2)	31 (75.6)	67 (72.0)
B. Dissociation (at least 3 symptoms)	25 (48.1)	25 (61.0)	50 (53.8)
C. Reexperiencing (at least 1 symptom)	35 (67.3)	28 (68.3)	63 (67.7)
D. Avoidance (at least 1 symptom)	32 (61.5)	31 (75.6)	63 (67.7)
E. Arousal (at least one symptom)	40 (76.9)	35 (85.4)	75 (80.6)
F. Impairment	22 (42.3)	14 (34.1)	36 (38.7)
ASD diagnosis (A + B + C + D + E + F)	11 (21.2)	7 (17.1)	18 (19.4)
'sub-ASD' diagnosis (A + C + D + E + F)	15 (28.8)	8 (19.5)	23 (24.7)
'Early PTSD' criteria			
Reexperiencing (at least 1 symptom)	36 (69.2)	33 (80.5)	69 (74.2)
Avoidance (at least 3 symptoms)	25 (48.1)	25 (61.0)	50 (53.8)
Arousal (at least 2 symptoms)	29 (55.8)	31 (75.6)	60 (64.5)
'Early PTSD' diagnosis ('early PTSD' criteria + A + F)	14 (26.9)	9 (22.0)	23 (24.7)

Note. ASD = Acute Stress Disorder; PTSD = Post-Traumatic Stress Disorder; RTA = Road Traffic Accident.

Chi-square comparisons between participants exposed to assaults and RTAs revealed a single difference with regards to the 'early PTSD' arousal criterion, where children and adolescents involved in RTAs were more likely to meet this criterion than those exposed to assaults (χ^2=3.94, df=1, p<.05). However, when the alpha value of this statistic was adjusted according to a Bonferroni correction for multiple comparisons, this difference did not remain.

6.1.3 The ability of ASD, 'early PTSD', and 'sub-ASD' criteria and diagnoses to predict PTSD at six month follow up

Diagnoses of ASD (χ^2=6.92, df=1, p<.009), 'sub-ASD' (χ^2=7.77, df=1, p<.005), and 'early PTSD' (χ^2=6.05, df=1, p<.01) significantly discriminated between children and adolescents who did or did not go on to have PTSD at follow up. The

sensitivity (i.e. the probability that someone diagnosed with PTSD at follow up had a given diagnosis etc. at initial interview), specificity (i.e. the probability that someone not diagnosed with PTSD at follow up did not have a given diagnosis etc. criterion at initial interview), positive predictive power (i.e. the probability that someone who has a given diagnosis etc. goes on to have a diagnosis of PTSD at 6 month follow up), and negative predictive power (i.e. the probability that someone who does not have a given diagnosis etc. does not go on to have a diagnosis of PTSD at 6 month follow up) of each ASD and 'early PTSD' criterion and diagnosis to predict PTSD at six months post-trauma are presented in Table 6.2. In addition, the number of participants whose PTSD status at six month follow up are correctly classified by a given criterion or diagnosis is presented in this table.

The ASD diagnosis in children and adolescents was good at predicting later PTSD in terms of its sensitivity, specificity, and positive and negative predictive power. However, a 'sub-ASD' diagnosis (i.e. ASD without dissociation) gave a better balance of sensitivity and specificity than the full ASD diagnosis and was able to correctly classify only a few less cases, despite the absence of an entire criterion. The 'sub-ASD' diagnosis was marginally better than a diagnosis of early 'PTSD' at predicting later PTSD (as evidenced by the data for specificity and number of cases correctly classified), suggesting that the reduced number of avoidance and arousal symptoms in ASD compared to PTSD had no associated predictive cost.

In terms of individual criteria, the dissociation criterion had comparable power to predict later PTSD as other individual ASD criteria, though overall impairment of functioning had the greatest accuracy, and alone was able to correctly classify a very large number of cases. The avoidance and arousal criteria for ASD were more sensitive but less specific than the corresponding criteria for 'early PTSD' at predicting later PTSD, as would be expected given their reduced symptom requirements.

Table 6.2. Sensitivity, specificity, and positive and negative predictive power of ASD, 'sub-ASD' and 'early PTSD' criteria and diagnoses to predict PTSD at six months post-trauma

Criterion/Diagnosis	Sensitivity	Specificity	Positive predictive power	Negative predictive power	Correct PTSD Classification N	Correct PTSD Classification %
ASD criteria:						
A. Traumatic stressor	1.00	0.32	0.17	1.00	26	40.6
B. Dissociation (at least 3 symptoms)	0.75	0.55	0.19	0.94	37	57.8
C. Reexperiencing (at least 1 symptom)	1.00	0.30	0.17	1.00	25	39.1
D. Avoidance (at least 1 symptom)	0.88	0.34	0.16	0.95	26	40.1
E. Arousal (at least one symptom)	1.00	0.23	0.16	1.00	21	32.8
F. Impairment	0.75	0.64	0.23	0.95	42	65.6
ASD diagnosis (A + B + C + D + E + F)	0.50	0.88	0.36	0.92	53	82.8
'Sub-ASD' diagnosis (A + C + D + E + F)	0.63	0.82	0.33	0.94	51	79.7
'Early PTSD' criteria:						
Reexperiencing (at least 1 symptom)	1.00	0.25	0.16	1.00	22	34.3
Avoidance (at least 3 symptoms)	0.50	0.45	0.11	0.86	29	45.3
Arousal (at least 2 symptoms)	0.88	0.38	0.17	0.95	28	43.8
'Early PTSD' diagnosis ('early PTSD' criteria + A + F)	0.63	0.79	0.29	0.94	49	76.6

Note. ASD = Acute Stress Disorder, PTSD = Post-Traumatic Stress Disorder.

6.1.4 The prevalence of ASD and 'early PTSD' symptoms

The prevalence of ASD and 'early PTSD' symptoms (including prevalence by trauma type) is displayed in Table 6.3. It is to be noted that a number of symptoms were commonly reported; reduced awareness and derealization either during or following a trauma, recurrent intrusive images or thoughts, avoidance of talk or thought about the trauma, and hypervigilance were all reported by at least half of

the sample. The 'early PTSD' symptoms of a sense of foreshortened future and the loss of developmentally acquired skills (a 'symptom' included in the ADIS-C as being a possible avoidance symptom, despite not being specifically mentioned by DSM-IV) were not frequently reported.

Table 6.3 Frequency of each ASD and 'early PTSD' symptom by trauma type at two to four weeks post-trauma

		Frequency (%)		
	Symptom	Assault (*N*=52)	RTA (*N*=41)	Total (*N*=93)
ASD:	Numbing	21 (40.4)	21 (51.2)	42 (45.2)
	Reduced awareness	28 (53.8)	22 (53.7)	50 (53.8)
	Derealisation	27 (51.9)	27 (65.9)	54 (58.1)
	Depersonalisation	18 (34.6)	17 (41.5)	35 (37.6)
	Dissociative amnesia	18 (34.6)	25 (61.0)	43 (46.2)
	Recurrent images or thoughts	26 (50.0)	24 (58.5)	50 (53.8)
	Dreams/nightmares	16 (30.8)	11 (26.8)	27 (29.0)
	Flashbacks	15 (30.8)	18 (43.9)	33 (35.5)
	Distress on exposure	12 (23.1)	17 (41.5)	29 (31.2)
	Avoidance of thoughts or talk about trauma	32 (61.5)	28 (68.3)	60 (64.5)
	Avoidance of places	21 (40.4)	22 (53.7)	43 (46.2)
	Difficulty sleeping	17 (32.7)	13 (31.7)	30 (32.3)
	Irritability	21 (40.4)	16 (39.0)	37 (39.8)
	Poor concentration	24 (46.2)	20 (48.8)	44 (47.3)
	Hypervigilance	31 (59.6)	32 (78.1)	63 (67.7)
	Exaggerated startle response	20 (38.5)	25 (61.0)	45 (48.4)
	Motor restlessness	18 (34.6)	23 (56.1)	41 (44.1)
'Early PTSD':				
	Loss of interest in activities	14 (26.9)	6 (14.6)	20 (21.5)
	Detachment from others	12 (23.1)	8 (19.5)	20 (21.5)
	Restricted range of affect	21 (40.4)	19 (46.3)	40 (43.0)
	Sense of foreshortened future	12 (23.1)	5 (12.2)	17 (18.3)
	Loss of developmentally acquired skills	3 (5.8)	7 (17.1)	10 (10.8)

Note. ASD = Acute Stress Disorder; PTSD = Post-Traumatic Stress Disorder; RTA = Road Traffic Accident.

Comparisons between participants exposed to assaults and RTAs revealed that children and adolescents involved in RTAs were more likely to experience dissociative amnesia (χ^2=6.41, df=1, p<.05), exaggerated startle response (χ^2=4.65, df=1, p<.05), and motor restlessness (χ^2=4.29, df=1, p<.05), than

children and adolescents involved in assaults. However, when Bonferroni corrections of alpha values for multiple comparisons were introduced these differences did not remain significant.

6.1.5 The ability of ASD and 'early PTSD' symptoms to predict PTSD at six month follow up

The sensitivity, specificity, positive and negative power, and number of cases correctly classified by each ASD and 'early PTSD' symptom are presented in Table 6.4.

Chi-square analyses revealed that children and adolescents who were identified as having PTSD at 6 month follow up reported more nightmares (χ^2=14.64, df=1, p<0.0001), distress on exposure to reminders of the trauma (χ^2=4.16, df=1, p<.05), difficulty sleeping (χ^2=12.40, df=1, p<0.0004), hypervigilance (χ^2=4.79, df=1, p<.05), and loss of interest in activities (χ^2=8.83, df=1, p<.003) at the initial interview than children who were not later diagnosed with PTSD. However, with alpha levels adjusted according to a Bonferroni correction for multiple comparisons, differences remained only for nightmares and difficulty sleeping.

These results were mirrored in the sensitivity and specificity statistics for these items. Nightmares and difficulty sleeping were highly sensitive and specific predictors of PTSD at follow up. Dissociation symptoms fared as well as most other symptoms at predicting later PTSD, with a reasonable trade-off between sensitivity and specificity. All symptoms assessed at the initial interview had high negative power for PTSD at follow up, that is, if a participant did not have the symptom it was very unlikely they would develop PTSD at follow up. However, the positive predictive power of all symptoms was very low, that is, having a given symptom at initial interview was not a clear risk for later PTSD.

Table 6.4. Sensitivity, specificity, and positive and negative predictive power of each ASD and 'early PTSD' symptom to predict PTSD at six months post-trauma

Item	Sensitivity	Specificity	Positive predictive power	Negative predictive power	Correct PTSD Classification	
					N	%
ASD						
Numbing	0.63	0.61	0.19	0.92	39	60.9
Reduced awareness	0.75	0.45	0.16	0.93	31	48.4
Derealisation	0.75	0.50	0.18	0.93	34	53.1
Depersonalisation	0.50	0.66	0.17	0.90	41	64.1
Dissociative amnesia	0.63	0.55	0.17	0.91	36	56.3
Recurrent images or thoughts	0.88	0.48	0.19	0.96	34	53.1
Dreams/nightmares	0.88	0.79	0.37	0.98	51	79.7
Flashbacks	0.50	0.64	0.17	0.90	40	62.5
Distress on exposure	0.63	0.73	0.25	0.93	46	71.9
Avoidance of thoughts or talk about trauma	0.88	0.39	0.17	0.96	29	45.3
Avoidance of places	0.63	0.59	0.18	0.92	38	59.4
Difficulty sleeping	0.88	0.75	0.33	0.98	49	76.6
Irritability	0.63	0.59	0.18	0.92	38	59.4
Poor concentration	0.63	0.46	0.14	0.90	31	48.4
Hypervigilance	1.00	0.39	0.19	1.00	30	46.9
Exaggerated startle response	0.75	0.55	0.19	0.94	37	57.8
Motor restlessness	0.75	0.57	0.20	0.94	38	59.4
'Early PTSD':						
Loss of interest in activities	0.63	0.84	0.36	0.94	52	81.3
Detachment from others	0.50	0.79	0.25	0.92	48	75.0
Restricted range of affect	0.75	0.59	0.21	0.94	39	60.9
Sense of foreshortened future	0.38	0.80	0.21	0.90	48	75.0
Loss of developmentally acquired skills	0.00	0.86	0.00	0.86	48	75.0

Note. ASD = Acute Stress Disorder; PTSD = Post-Traumatic Stress Disorder.

6.2 Post-traumatic stress symptomatology as assessed by self-report questionnaire

In this sub-section participants' mean scores on the child version of the Revised Impact of Events Scale (RIES-C; Dyregrov & Yule, 1995; Smith, Perrin, Dyregrov, & Yule, 2003), a continuous self-report measure of post-traumatic stress symptomatology, will be presented, and differences between time points

and trauma types examined. In addition, the ability of early RIES-C scores to predict later RIES-C scores will be presented.

6.2.1 Post-traumatic stress symptomatology as assessed by self-report questionnaire at two to four weeks, three months and six months post-trauma

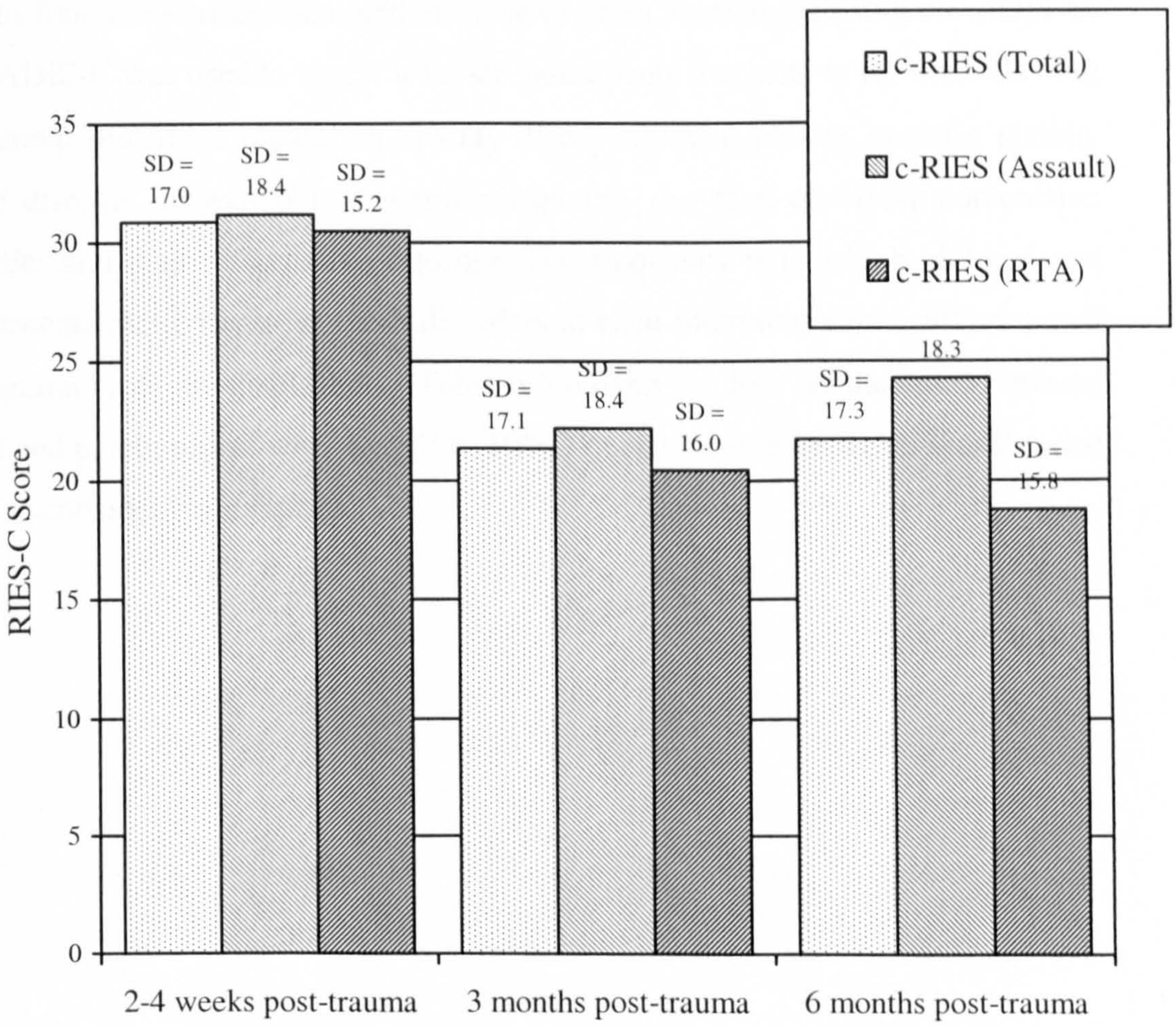
Participants' scores on the RIES-C, differentiated by trauma type, are displayed in Figure 6.2. These scores were subjected to a repeated measures two-way (time point by trauma type) ANOVA. According to a Box's M statistic for this analysis, the included variables were found to have homogeneity of variance. A significant main effect of time point was found ($F=20.73$, $df=2, 68$, $p<.0001$), but there was no main effect of trauma type, or time point by trauma type interaction. Tukey post-hoc comparisons revealed that RIES-C scores at two to four weeks were significantly greater than scores at three month and at six months, but that three month scores were not greater than six month scores, or six month scores greater than three month scores. The apparent difference between assault and RTA participants, especially at the six month time point, were not validated by these statistics.

Concern that these statistics may have been the result of the small numbers of cases (N=36) that completed the questionnaire at each time point and were eligible for the ANOVA, led to the use of t-tests to verify the above results. No significant differences were found between assault and RTA participants with regards to two to four week RIES-C scores (N=90), three month RIES-C scores (N=50), or six month RIES-C scores (N=67), though at three months the difference was approaching significance ($t=1.73$, $df=65$, $p<.1$).

Further t-tests revealed that RIES-C scores at two to four weeks were significantly greater than scores at three months ($t=5.70$, $df=42$, $p<.0001$), and scores at six months ($t=7.37$, $df=57$, $p<.0001$), though there was no significant difference between scores at three months and six months. Additional confirmation of the constancy of post-traumatic stress symptomatology between the three month and six month assessment points was derived from examining participants' scores on the Child Post-traumatic Symptom Scale (CPSS; Foa, Johnson, Feeny, &

Treadwell, 2001), a relatively novel self-report questionnaire that was only completed by children at the three month and six month assessment point. A repeated measures t-test revealed there to be no significant difference between participants' scores at these two assessment points.

Figure 6.2. RIES-C scores by time point and trauma type



6.2.2 Correlations between post-traumatic stress symptomatology as assessed by self-report questionnaire at different time points

The ability of RIES-C scores at two to four weeks to predict later scores was assessed using correlations. Two to four week RIES-C scores were significantly correlated with both three month scores ($r=.78$, $p<.0001$) and six month scores ($r=.79$, $p<.0001$). In addition, three month RIES-C scores were significantly correlated with six month scores ($r=.81$, $p<.0001$).

6.3 Non-post-traumatic stress psychopathology as assessed by semi-structured interview

A range of psychopathology other than post-traumatic stress was assessed at the two to four week assessment and at the six month assessment using the ADIS-C. The ADIS-C was used to assess whether participants met criteria for the following emotional disorders: separation anxiety disorder, social phobia, specific phobia, panic disorder, agoraphobia, generalised anxiety disorder, obsessive compulsive disorder and major depressive disorder. The frequency with which children and adolescents met criteria for these disorders at each interview point, differentiated by trauma type, are displayed in Table 6.5. Given the low concordance between child and parent report with regards to PTSD questions (see above) it was decided only to consider child reports.

Table 6.5. Frequency of other (non-PTSD) diagnoses by interview time point and trauma type

	Frequency at 2-4 week interview (%)			Frequency at 6-month interview (%)		
Diagnosis	Assault (N=47)	RTA (N=37)	Total (N=84)	Assault (N=33)	RTA (N=24)	Total (N=57)
Separation Anxiety Disorder	3 (6.4)	1 (2.7)	4 (4.8)	0 (0.0)	1 (4.2)	1 (1.8)
Sub-clinical Separation Anxiety Disorder	4 (8.5)	2 (5.4)	6 (7.1)	-	-	-
Social Phobia	1 (2.1)	1 (2.7)	2 (2.4)	1 (3.0)	1 (4.2)	2 (3.5)
Sub-clinical Social Phobia	0 (0.0)	0 (0.0)	0 (0.0)	-	-	-
Specific Phobia	5 (10.6)	6 (16.2)	11 (13.1)	2 (6.1)	3 (12.5)	5 (8.8)
Sub-clinical Specific Phobia	0 (0.0)	0 (0.0)	0 (0.0)	-	-	-
Panic Disorder	0 (0.0)	1 (2.7)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
Sub-clinical Panic Disorder	1 (2.1)	0 (0.0)	1 (1.2)	-	-	-
Agoraphobia without Panic Disorder	1 (2.1)	1 (2.7)	2 (2.4)	1 (3.0)	0 (0.0)	1 (1.8)
Agoraphobia with Panic Disorder	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Generalised Anxiety Disorder	3 (6.4)	3 (8.1)	6 (7.1)	3 (9.1)	2 (8.3)	5 (8.8)
Sub-clinical Generalised Anxiety Disorder	2 (4.3)	2 (5.4)	4 (4.8)	-	-	-
Obsessive-Compulsive Disorder	1 (2.1)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
Major Depressive Disorder	4 (8.5)	3 (8.1)	7 (8.3)	4 (12.1)	1 (4.2)	5 (8.8)

Note. PTSD = Post-Traumatic Stress Disorder; RTA = Road Traffic Accident. 'Sub-clinical' signifies that the participant met all criteria for the diagnosis except for the duration criterion. At the six month follow up interview, 'sub-clinical' diagnoses were not made (indicated by a hyphen).

The most common disorders diagnosed in the study sample were specific phobia and major depressive disorder, at both time points. Contrasting the prevalence of these diagnoses in this sample with larger community studies, it is apparent that a few diagnoses are more common. Schniering, Hudson, and Rapee (2000), in their review of research into the epidemiology of anxiety disorders in youth, suggest prevalence rates of 0.6-2.4% for separation anxiety disorder, up to 6.3% for social phobia, 5.1-9.2% for specific phobia, 0.3% for panic disorder, 2.9-4.6% for generalised anxiety disorder, and 3% for obsessive-compulsive disorder. In their review of the epidemiology of depression in children and adolescents, Kessler, Avenevoli, and Ries Merikangas (2001) report a prevalence rate for major depressive disorder of 1-6%. In the case of this study, therefore, it would appear that the numbers of children meeting criteria for separation anxiety disorder and

generalised anxiety disorder at the initial interview, and major depressive disorder at both interviews, were higher than might be expected. Indeed, the findings presented here are quite similar to those reported in a study of a large sample of children and adolescents exposed to a ferry disaster. Bolton, O'Ryan, Udwin, Boyle and Yule (2000) observed elevated levels of separation anxiety disorder (6.8%), specific phobia (23.6%), panic disorder (12.0%), and major depression (17.2%) in the five to eight years following the disaster, relative to a control group who were not exposed to the disaster.

Chi-square analyses, modified to account for the presence of expected values less than five (Clark-Carter, 1997) were performed on the frequencies of each non-PTSD disorder. No significant differences in the frequency of non-PTSD disorders between participants exposed to assaults and RTAs were found at either assessment point.

Table 6.6 shows the frequency of non-PTSD diagnoses by ASD diagnosis (at initial interview) and by PTSD diagnosis (at six month follow up interview). Chi-square analyses, again modified to account for the presence of expected values less than five (Clark-Carter, 1997) were performed on the frequencies of each non-PTSD disorder. Participants with ASD were found to be more likely than participants without ASD to meet criteria for separation anxiety disorder (χ^2=10.01, df=1, p<.002), panic disorder (χ^2=4.93, df=1, p<.05), agoraphobia without panic disorder (χ^2=9.98, df=1, p<.002), 'sub-clinical' (i.e. without the duration criterion) generalised anxiety disorder (χ^2=10.01, df=1, p<.002), obsessive compulsive disorder (χ^2=4.93, df=1, p<.03), and major depressive disorder (χ^2=25.53, df=1, p<.0001), at the initial interview. At the six month follow up interview, participants with PTSD were found to be more likely than participants without PTSD to meet criteria for agoraphobia without panic disorder (χ^2=7.14, df=1, p<.008), generalised anxiety disorder (χ^2=11.38, df=1, p<.0008), and major depressive disorder (χ^2=11.38, df=1, p<.0008).

Table 6.6. Frequency of other (non-PTSD) diagnoses by interview time point and ASD/PTSD diagnosis

	Frequency at 2-4 week interview (%)			Frequency at 6 month interview (%)		
Diagnosis	No ASD (N=69)	ASD (N=14)	Total (N=83)	No PTSD (N=50)	PTSD (N=7)	Total (N=57)
Separation Anxiety Disorder	1 (1.4)	3 (21.4)	4 (4.8)	1 (2.0)	0 (0.0)	1 (1.8)
Sub-clinical Separation Anxiety Disorder	4 (5.8)	2 (14.3)	6 (7.2)	-	-	-
Social Phobia	1 (1.4)	1 (7.1)	2 (2.4)	1 (2.0)	1 (14.3)	2 (3.5)
Sub-clinical Social Phobia	0 (0.0)	0 (0.0)	0 (0.0)	-	-	-
Specific Phobia	7 (10.1)	4 (28.6)	11 (13.3)	4 (8.0)	1 (14.3)	5 (8.8)
Sub-clinical Specific Phobia	0 (0.0)	0 (0.0)	0 (0.0)	-	-	-
Panic Disorder	0 (0.0)	1 (7.1)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
Sub-clinical Panic Disorder	1 (1.4)	0 (0.0)	1 (1.2)	-	-	-
Agoraphobia without Panic Disorder	0 (0.0)	2 (14.3)	2 (2.4)	0 (0.0)	1 (14.3)	1 (1.8)
Agoraphobia with Panic Disorder	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Generalised Anxiety Disorder	3 (4.3)	2 (14.3)	5 (6.0)	2 (4.0)	3 (42.9)	5 (8.8)
Sub-clinical Generalised Anxiety Disorder	1 (1.4)	3 (21.4)	4 (4.8)	-	-	-
Obsessive-Compulsive Disorder	0 (0.0)	1 (7.1)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
Major Depressive Disorder	1 (1.4)	6 (42.9)	7 (8.4)	2 (4.0)	3 (42.9)	5 (8.8)

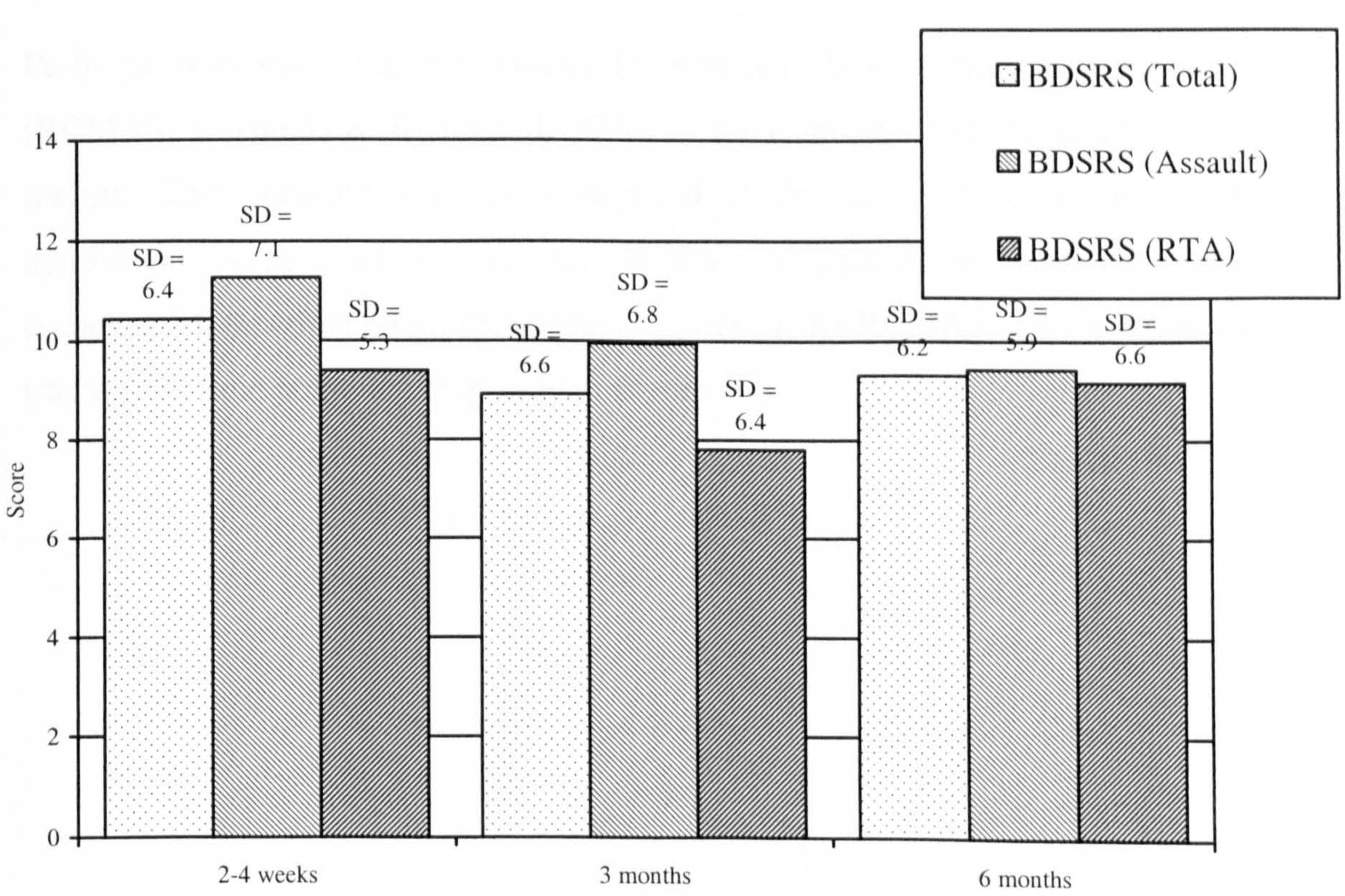
Note. ASD = Acute Stress Disorder; PTSD = Post-Traumatic Stress Disorder. 'Sub-clinical' signifies that the participant met all criteria for the diagnosis except for the duration criterion. At the six month follow up interview, 'sub-clinical' diagnoses were not made (indicated by a hyphen).

An independent samples t-test, modified to account for heterogeneity of variance, found that participants with ASD (mean number of other diagnoses = 1.79) were found to have significantly more non-trauma-specific diagnoses than participants without ASD (mean number of other diagnoses = .28) at the initial interview ($t=2.53$, $df=13.3$, $p<.03$). A second t-test, again modified to account for heterogeneity of variance, found a trend towards participants with PTSD (mean number of other diagnoses = 1.38) having more other non-trauma-specific diagnoses than participants without PTSD (mean number of other diagnoses = .57) at the six month follow up interview ($t=2.06$, $df=6.29$, $p=.08$).

6.4 Depressive and anxious symptomatology as assessed by self-report questionnaire at each assessment point

Children and adolescents participating in Study 2 completed the Birleson Depression Self-Rating Scale (BDSRS; Birleson, 1981), a self-report measure assessing depressive symptomatology, at each time point in the study (two to four weeks, three months, and six months post-trauma). Participants' scores on the BDSRS, differentiated by trauma and time point, are displayed in Figure 6.3. Scores on this measure appeared to be elevated at each time point relative to British normative data (mean = 8.53; Yule, 1998), and appeared to be elevated at the initial assessment relative to sample of youth exposed to the civil war in Bosnia-Hercegovina (Smith et al., 2001).

Figure 6.3. BDSRS scores by time point and trauma type

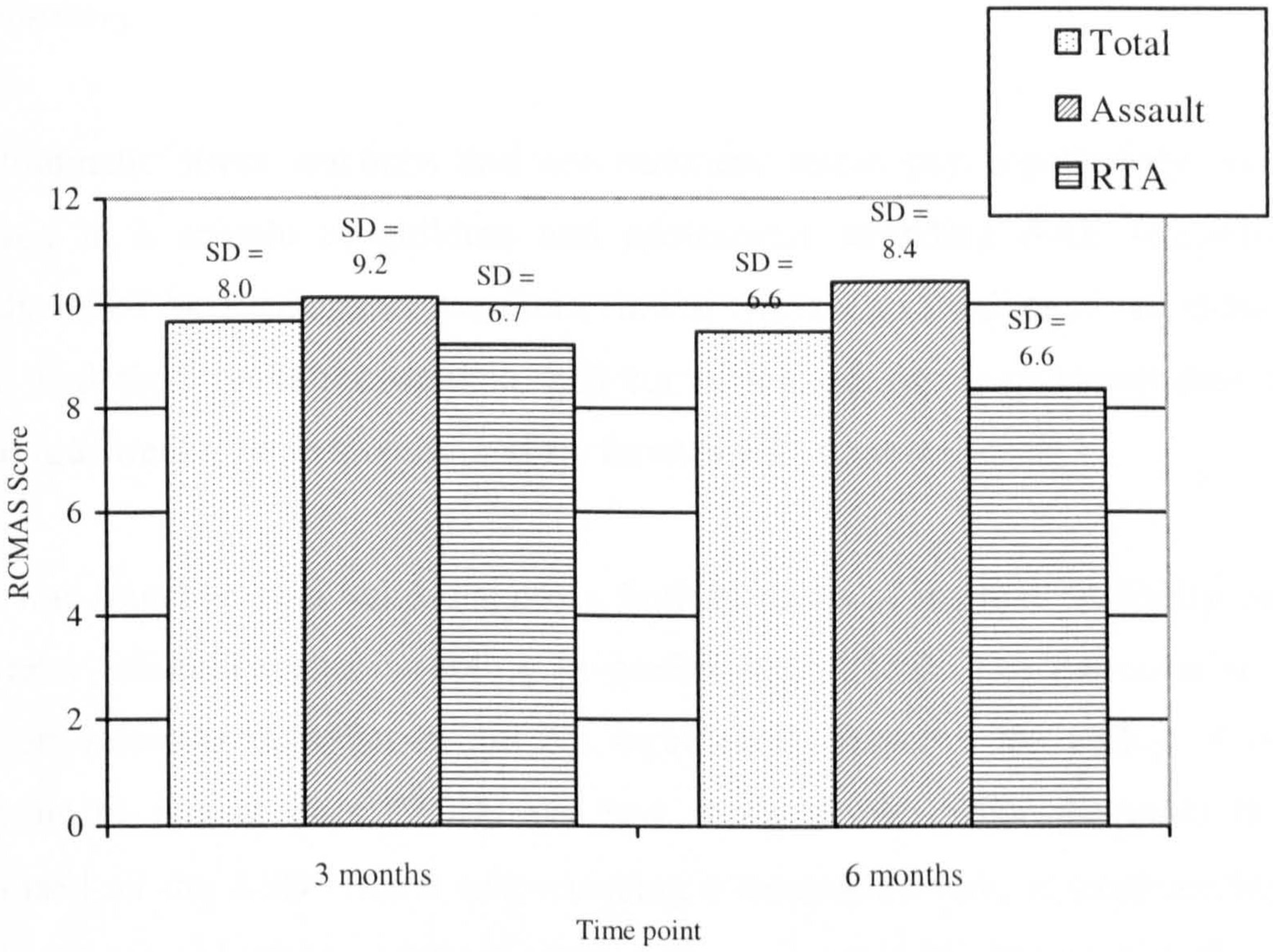


BDSRS scores were subjected to a repeated measures two-way (time point by trauma type) ANOVA. According to a Box's M statistic for this analysis, the included variables were found to have homogeneity of variance. No significant main effect of time point, trauma type, or time point by trauma type interaction, was found.

Concern that these statistics may have been the result of the small numbers of cases (N=38) that completed the questionnaire at each time point and were eligible for the ANOVA, led to the use of t-tests to verify the above results. Between subjects t-tests revealed no significant differences between assault and RTA participants with regards to two to four week BDSRS scores (N=90), three month BDSRS scores (N=52), or six month BDSRS scores (N=67). Repeated measures t-tests revealed that the drop in BDSRS scores between the two to four week assessment and the six month assessment was approaching significance (t=1.97, df=57, p=.053), but there no was no significant difference between scores at two to four weeks and three months, and scores between three months and six months.

Participants in Study 2 also completed the Revised Child Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) at three months and six months post-trauma. This measure was not completed at the initial two to four week assessment because of the number of other self-report questionnaires also completed at this time point. Participants' scores on the RCMAS, differentiated by trauma and time point, are displayed in Figure 6.4.

Figure 6.4. RCMAS scores by time point and trauma type



Scores at each time point were lower than normative data for American youth (mean = 13.84; Reynolds & Richmond, 1978), and were lower than the level observed in a sample of youth exposed to civil war in Bosnia-Hercegovina (mean = 10.93; Smith et al., 2001). RCMAS scores were subjected to a repeated measures two-way (time point by trauma type) ANOVA. According to a Box's M statistic for this analysis, the included variables were found to have homogeneity of variance. A significant main effect of time point was observed ($F = 4.58$, $df = 1, 39$, $p<.039$), but no main effect for trauma type, or time point by trauma type interaction.

The main effect of time point did not seem to correspond to the data displayed in Figure 6.4. As with the data for the BDSRS, however, there was concern that these results were skewed by the cases that did not complete both assessments, and hence were not eligible for this analysis. T-tests were used therefore to examine these data for between-groups differences regarding trauma type at each time point. Again, no differences in anxiety levels between assault and RTA groups were observed at either the three month or six month time points.

6.5 Summary

Post-traumatic stress reactions and non-traumatic stress psychopathology were assessed in a sample of children and adolescents attending A&E following assaults or RTAs. Participants were interviewed with their caregiver at two to four weeks and six months post-trauma, and completed self-report questionnaires at two to four weeks, three months ,and six months post-trauma.

ASD was found to be a valid diagnosis, both in terms of internal reliability and inter-rater reliability, and its ability to predict later PTSD. The inclusion of a criterion assessing dissociation did not significantly improve the ability of the diagnosis to predict later PTSD over and above a 'sub-ASD' diagnosis that comprised all the ASD criteria (experiencing a traumatic event, re-experiencing, avoidance, arousal, and impairment of functioning), except for dissociation. There was poor agreement between child and caregiver reports in the interview, with the result that for the remainder of the investigation it was considered appropriate to rely on the child's report only. There were no differences between participants exposed to assaults and RTAs in the prevalence of ASD symptoms and either ASD, 'sub-ASD' or 'early PTSD' diagnoses, or PTSD at six month follow up. Two individual ASD symptoms, nightmares and difficultly sleeping, distinguished participants who went on to meet criteria for PTSD at follow up from participants who did not meet criteria for PTSD at follow up.

Participants' post-traumatic stress symptomatology was assessed with the RIES-C at each assessment point. Scores on this self-report questionnaire were found to decrease between the two to four week assessment point and the three month assessment point, but not between the three month and six month assessment points. Again there were no differences between children and adolescents exposed to different trauma types.

Psychopathology other than ASD and PTSD were assessed at the two to four week and six month follow up assessments by the ADIS-C. Separation anxiety disorder, generalised anxiety disorder, and at the final assessment only, major

depressive disorder, were found to occur at a higher rate than might be expected. No differences between assault-exposed and RTA-exposed participants in the prevalence of non-traumatic stress related disorders were observed. Children and adolescents with ASD at the two to four week assessment were found to be more likely to meet criteria for separation anxiety disorder, panic disorder, agoraphobia without panic disorder, generalised anxiety disorder (without the duration criterion), obsessive compulsive disorder and major depressive disorder than children and adolescents without ASD. At the final assessment children and adolescents with PTSD were found to be more likely to meet criteria for agoraphobia without panic disorder, generalised anxiety disorder, and major depressive disorder than children and adolescents without PTSD.

Depressive psychopathology, in addition to being assessed by the major depressive disorder questions of the ADIS-C, was assessed using the BDSRS self-report questionnaire at two to four weeks, three months and six months post-trauma. Both a two-way ANOVA and t-tests revealed no differences between the scores of assault-exposed and RTA-exposed participants, and no difference in scores between the three assessment points. Anxious psychopathology, as assessed by the RCMAS, was found to decrease between the three month and six month follow up assessments, but no trauma type differences were observed.

With regards to the reasons stated at the beginning of this chapter for examining both post-traumatic stress and non-traumatic stress psychopathology in children and adolescents exposed to assaults to RTAs, it can be concluded that:

1. Post-traumatic stress, in the sample assessed, was found to decrease between two to four weeks and three months following a trauma; supporting the distinction between onset and maintenance processes in the aetiology of PTSD in this population;

2. A diagnosis of ASD has merit with regards to its ability to predict later PTSD, though the inclusion of the dissociation criterion within this diagnosis may not add to its usefulness;

3. Children and adolescents exposed to assaults would appear to be as likely to experience post-traumatic stress following a trauma as children and adolescents exposed to RTAs;

4. Children and adolescents exposed to traumatic events may be at increased risk of experiencing psychopathology other than PTSD, though children and adolescents with PTSD are at an even greater risk.

Chapter 7: Predictors of PTSD in a sample of children and adolescents exposed to assaults and RTAs (Study 2)

In this chapter the data concerning predictors of PTSD in a sample of children and adolescents exposed to assaults and RTAs will be presented. This sample was drawn from an Accident and Emergency department in South London. Participants completed a semi-structured interview assessing PTSD, anxious, and depressive psychopathology at two to four weeks and six months post-trauma, and self-report questionnaires assessing psychopathology, cognitive styles, appraisals, and psychosocial aspects of their response to the disaster at two to four weeks, three months, and six months post-trauma (see chapter 3 for full details of the assessment measures used, recruitment procedures, and demographic information of the recruited sample). Participants' scores on the novel self-report measures devised for use in this study were calculated according to the components analyses performed in chapter 4.

The study was undertaken so that the role of cognitive processes in the onset and maintenance of PTSD in children and adolescents might be distinguished. To date, only two prospective studies have explicitly tested the role of cognitive processes postulated by adult PTSD theorists such as Brewin et al. (1996) and Ehlers and Clark (2000) in a child and adolescent population (for further details of these adult models please see chapter 1). Ehlers, Mayou, & Bryant (2003) conducted a prospective study in child and adolescent survivors of RTAs, and found that data-driven processing during the accident, appraisals of the trauma and its impact, and cognitive strategies such as rumination, thought suppression, and persistent dissociation accounted for a significant proportion of variance in post-traumatic stress symptoms at six months post-trauma, over and above demographic and accident severity variables. Similarly, Stallard (2003), in a cross-sectional study of children and adolescents involved in RTAs, found that the negative appraisal of trauma sequelae and the use of distraction and rumination were more likely to occur in participants with PTSD than participants without PTSD. While these studies have contributed a considerable amount to our understanding of PTSD in children and adolescents, they each have focused solely on RTA survivors, and

have used measures comprising only a single item, the reliability of which cannot therefore be assessed.

The present study was designed with these considerations in mind. In addition, two further theoretical and methodological concerns were noted. Firstly, a number of studies have demonstrated that prior emotional disorder makes a child or adolescent more vulnerable to experiencing PTSD (Asarnow et al., 1999; La Greca, et al. 1998). However, what mechanisms are responsible for this relationship between pre-trauma emotional disorder and post-traumatic stress has not been investigated. The possibility that pre-existing maladaptive cognitive styles would be related to the maintenance of post-traumatic stress was considered to be a conceivable pathway whereby prior emotional disorder might be related to increased PTSD. Secondly, it was thought that using single-item measures that relate exclusively to the traumatic event may simply be indices of PTSD or general distress, rather than distinct psychopathological processes. In order to incorporate these considerations, it was decided to use multiple item measures that were not trauma-specific, and might relate to pre-existing emotional disorder.

The particular cognitive and psychosocial processes to be investigated in this study were:

i. Appraisal of threat,
ii. Quality of memories of the frightening event,
iii. Anxiety sensitivity (i.e. negative beliefs regarding the meaning of anxiety symptoms),
iv. Positive beliefs about worry,
v. Ruminative coping style,
vi. Attitudes towards emotional expression,
vii. Negative appraisals of the trauma and its sequelae (assessed at three months and six months post-trauma only), and
viii. Maladaptive thought control strategies and trauma-focused rumination.

These processes were investigated with regards to PTSD symptomatology in the acute phase (two to four weeks) and after an extended duration (six months), using both correlational and regression analyses. Specifically it was predicted that the

appraisal of threat and memory quality would be related to the onset of PTSD, while the remaining processes would be involved in the maintenance of PTSD. Regression analyses were used to investigate whether those cognitive processes hypothesised to be related to the maintenance of PTSD (i.e., ruminative style, endorsement of worry, a negative attitude towards to emotional expression, negative appraisals of the trauma and its sequelae, and maladaptive thought control strategies) would account for variance in PTSD scores at six months over and above the variance accounted for by PTSD scores at two to four weeks.

Regression analyses were also used to examine the extent to which demographic and objective trauma-related variables are involved in the aetiology of PTSD. While it has been demonstrated that demographic and trauma-related variables are moderately good predictors of PTSD at one to three months (La Greca et al., 1996), it was predicted that in the current investigation the cognitive processes outlined above would continue to predict PTSD at 6 months, over and above such variables.

The relationship between non-trauma specific cognitive styles (in particular rumination) and maladaptive trauma-specific appraisals and coping strategies was explored using correlational techniques. The purpose of this investigation also was to examine whether pre-traumatic maladaptive cognitive styles had an impact on a child or adolescent's response to trauma, and affected their appraisals and coping strategies in response to it. A final set of regression analyses were conducted to examine whether the cognitive processes hypothesised to predict later PTSD would be involved also in the onset and maintenance of depressive responses to the trauma experienced.

7.1 Relationships between demographic, history, and objective trauma severity variables and PTSD at each time point

Pearson's Product Moment correlations between each of the demographic, history, and objective trauma severity variables (i.e. triage category, admission to hospital, and fracture) and PTSD symptomatology at each time point (as assessed by the RIES-C and the CPSS) are shown in Table 7.1. The only variable found to be

significantly correlated with PTSD symptomatology was being admitted to hospital following attendance at A&E. This variable was not correlated with RIES-C scores at the two to four week assessment, but was correlated with each of the PTSD measures used at the three-month follow-up, and CPSS scores at six month follow up.

Table 7.1 Correlations between demographic and objective trauma severity variables and PTSD symptomatology at each time point

	PTSD symptomatology				
	2-4 weeks (n=83)	3 months (n=41)		6 months (n=63)	
Variable	RIES-C	RIES-C	CPSS	RIES-C	CPSS
Age	-.10	.01	.16	.11	.18
Sex[a]	-.16	-.20	-.11	-.16	-.13
Prior emotional disorder[a]	-.03	-.04	.05	.12	.12
Prior exposure to trauma[a]	-.10	-.09	-.07	-.14	-.07
Trauma type[a]	-.02	-.05	-.07	-.16	-.21
Triage category	-.07	.08	.14	.05	.08
Fracture[a]	-.14	-.04	-.02	.03	-.05
Admitted to hospital[a]	.07	.28*	.31*	.15	.24*

Note: [a]These measures were dichotomously coded and examined using point-biserial correlations, a variant of Pearson's Product Moment Correlation. RIES-C = Revised Impact of Event Scale, child version; CPSS = Child Post-traumatic Stress Scale. * p<.05

7.2 Relationships between cognitive and psychosocial processes and PTSD at each time point

Pearson's Product Moment correlations between the various cognitive and psychosocial processes assessed and PTSD symptomatology at each time point are displayed in Table 7.2.

With regards to measures completed by participants at the initial, two to four week assessment, each of the items assessing threat and subjective index of trauma severity were significantly correlated with PTSD at each time point on at least one

measure. The items assessing confusion and dissociation were for the most part correlated with PTSD at the initial assessment and predictive of PTSD at the three and six month follow-up assessments. The item "I didn't have any feelings about what was happening" was not significantly correlated with PTSD scores as assessed by either measure at any time point.

Anger directed towards the people responsible for either the assault or RTA was found not to be correlated with PTSD at the initial assessment, or with PTSD as assessed at follow-up. Anger directed towards self, however, was found to be both a correlate of PTSD at the two to four week assessment and predictive of PTSD at three and six months, as assessed by each measure of PTSD. The child or adolescent's report of the fear of any adults present during the experienced assault or RTA was correlated with PTSD at the initial assessment but failed to predict PTSD at either follow-up.

Table 7.2 Correlations between cognitive and psychosocial variables and PTSD symptomatology at each time point

	PTSD symptomatology				
	2-4 weeks	3 months		6 months	
Variable	RIES-C	RIES-C	CPSS	RIES-C	CPSS
Measures at 2-4 weeks:	(n=85)	(n=41)		(n=56)	
Subjective sense of threat items:					
I really thought that I was going to die	.31**	.48**	.35*	.43***	.28*
I thought that I was going to be very badly hurt	.40***	.41**	.35*	.36**	.34**
I was really scared	.51****	.41**	.29	.35**	.28*
I was scared that someone else might get badly hurt	.31**	.56***	.43**	.29*	.25
Confusion and dissociation items:					
I couldn't believe this was happening to me	.41****	.28	.28	.45***	.41**
I didn't feel like I was really there	.43****	.49**	.33*	.40**	.37**
I didn't have any feelings about what was happening	.00	-.11	-.11	-.08	-.06
I didn't understand what was happening	.44****	.41**	.34*	.33*	.30*
It all felt like a dream	.39***	.37*	.26	.48***	.34**
My mind went blank	.44****	.39*	.33*	.40**	.40**
Anger items:					
Just after the frightening event I was really angry with the people who caused the event	.13	.25	.14	.13	.08
Just after the frightening event, I was really angry with myself	.27*	.32*	.34*	.39**	.39**
Child's rating of adult's fear	.28*	.40	.35	.29	.31
MMQ	.78****	.50***	.40**	.54****	.52****
cTCQ distraction	.01	.27	.14	.05	.02
cTCQ reappraisal	.46****	.38**	.32*	.46***	.35**
cTCQ social support	.18	.30*	.37*	.32*	.26
RSQ	.68****	.60****	.62****	.62****	.71****
CASI	.68****	.62****	.57****	.65****	.59****
AEE	.11	.13	.12	.20	.26*
MCQ	.37***	.47**	.37*	.40**	.37**

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Table 7.2 Correlations between cognitive and psychosocial variables and PTSD symptomatology at each time point – cont.

	PTSD symptomatology				
	2-4 weeks	3 months		6 months	
Variable	RIES-C	RIES-C	CPSS	RIES-C	CPSS
Measures at 3 months:		(n=45)		(n=39)	
cPTCI "permanent change"	-	.67****	.72****	.59****	.64****
cPTCI "scary world"	-	.68****	.77****	.59****	.69****
cPTCI total score	-	.72****	.79****	.62****	.70****
Anger item ("I will always be angry with the people who caused the frightening event")	-	.56****	.47***	.40**	.47**
Omen formation item ("I had a feeling the frightening event was going to happen")	-	.34*	.32*	.26	.27
Thought suppression item	-	.77****	.63****	.74****	.71****
Distraction item	-	.79****	.60****	.75****	.63****
Rumination (sum of 3 items)	-	.70****	.60****	.61****	.60****
Measures at 6 months:				(n=65)	
cPTCI "permanent change"	-	-	-	.68****	.60****
cPTCI "scary world"	-	-	-	.67****	.73****
cPTCI total score	-	-	-	.73****	.73****
Anger item ("I will always be angry with the people who caused the frightening event")	-	-	-	.40***	.46****
Omen formation item ("I had a feeling the frightening event was going to happen")	-	-	-	.32**	.35**
Thought suppression item	-	-	-	.62****	.53****
Distraction item	-	-	-	.73****	.64****
Rumination (sum of 3 items)	-	-	-	.78****	.76****

Note: PTSD = Post-Traumatic Stress Disorder; RIES-C = Revised Impact of Event Scale, child version; CPSS = Child Post-traumatic Stress Scale; MMQ = Memory Modality Questionnaire; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire; CASI = Childhood Anxiety Sensitivity Index; AEE = Attitudes towards Emotional Expression questionnaire; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale; cPTCI = Post-Traumatic Cognitions Inventory, child version.

* p<.05; ** p<.01; *** p<.001; **** p<.0001

Memory quality, as assessed by the MMQ, was found to be a strong correlate of PTSD at the initial assessment, and was also a good predictor of PTSD scores at three and six months. With regards to measures of children's strategies for typically coping with unwanted and intrusive thoughts and memories, relationships with PTSD at each time point differed between the sub-scales of the cTCQ. The distraction sub-scale was found not be associated with PTSD at any

time point. The re-appraisal sub-scale was significantly and positively correlated with PTSD scores at each time point and on each measure used at the follow-up assessments to measure PTSD symptomatology. The social support sub-scale was not correlated with PTSD symptomatology at the initial assessment, but was positively correlated with both PTSD measures at the three-month follow-up and the RIES-C at six months.

Both the RSQ and CASI were positive and strong correlates of PTSD at two to four weeks, and positive and strong predictors of PTSD at three months and six months. The AEE was not a correlate of PTSD at two to four weeks or a predictor of PTSD at three months, but was a significant positive predictor of scores on the CPSS at the six-month follow-up. The MCQ (positive beliefs sub-scale) was positively and moderately correlated with PTSD scores at each time point.

With regards to measures completed by participants at the three-month follow-up, each sub-scale of the cPTCI and the cPTCI total score were strong correlates of PTSD at that time point, and strong predictors of PTSD at the six-month follow-up. The trauma-related thought suppression, distraction, and rumination items were similarly related to PTSD scores at three months and at six months. Ongoing anger directed at those responsible for the assault or RTA was a similarly significant and positive correlate of PTSD at three months and six months, while the omen formation item was a moderate correlate of PTSD at three months but failed to predict PTSD significantly at six months. With regards to measures completed by participants at the final six-month follow-up assessment, each measure, including the omen formation item, was found to be significantly and positively correlated with PTSD. The cPTCI sub-scale and total scores and the thought suppression, distraction, and rumination items were particularly strongly correlated with PTSD as measured by the RIES-C and the CPSS.

7.3 Regression models of PTSD

Regression modelling was used to identify whether demographic, trauma-related, and cognitive process variables would have a role in the onset and maintenance of PTSD in participants in Study 2. In the first set of analyses conducted, the

dependent variable used was RIES-C scores at two to four weeks, with the aim of identifying processes involved in the onset of PTSD. In the second and third sets of analyses RIES-C and CPSS scores at six months were used as the dependent variable, with the aim of identifying processes involved in the maintenance of PTSD. Hierarchical regression modelling was selected as the mode of entering variables so as to see whether the variables entered on each step would account for unique variance over and above previous steps. It was initially planned to enter variables in the following steps:

i. Demographic variables (i.e. age, sex, prior history of trauma, prior history of emotional disorder),
ii. Objective indices of trauma severity (i.e. triage category, fracture, admission to hospital),
iii. Subjective indices of trauma severity (subjective threat items),
iv. Memory quality (as assessed by the MMQ),
v. Cognitive and psychosocial variables (other than memory quality) assessed at two to four weeks (cTCQ sub-scales, RSQ, CASI, MCQ, AEE), and for the analyses examining processes involved in the maintenance of PTSD at six months,
vi. Cognitive and psychosocial variables assessed at three months (cPTCI, and thought suppression, distraction, and rumination items).

However, since a number of variables were found not to be correlated with PTSD symptoms, these variables (age, sex, prior history of trauma, prior history of emotional disorder, fracture, triage category, cTCQ distraction, and AEE) were not entered into the regression models, in order to improve the power of the regression analyses conducted. It was therefore decided to use the following steps for entering variables:

i. Objective index of trauma severity (admission),
ii. Subjective indices of trauma severity (subjective threat items),
iii. Memory quality (as assessed by the MMQ),
vii. Cognitive and psychosocial variables (other than memory quality) assessed at two to four weeks (cTCQ reappraisal and social support, RSQ, CASI, MCQ), and for the analyses examining processes involved in the maintenance of PTSD at six months,

viii. Cognitive variables assessed at three months (sub-scales of the cPTCI, and thought suppression, distraction, and rumination items).

In order to assess whether the assumptions of regression analysis were met (i.e. normality, linearity, and homoscedasticity), residuals produced by each regression were examined. These assumptions are met when there is no obvious relationship between predicted scores on the independent variable and residuals, as observed in a scatterplot of these scores (Tabachnick & Fidell, 1996). All these assumptions were met in the analyses conducted in this chapter. Furthermore, regression will not work correctly if there is multicollinearity among independent variables entered in the model. Where independent variables were found to be highly correlated (i.e. greater than .8) one variable was omitted from the regression analysis, based on theoretical concerns. A strong correlation between the thought suppression and distraction items (r=.84) meant that one of these items had to be discarded. The distraction item was not included in the regression analyses performed here as thought suppression was considered to be the more important measure, because of the experimental evidence concerning this strategy (Purdon, 1999). A strong correlation between the sub-scales of the cPTCI led to the use of the total score for this measure in the regression analyses performed in this chapter.

7.3.1 Regression models: The ability of cognitive processes to account for PTSD at two to four weeks

Regression models were conducted so as to examine what processes were involved in the onset of PTSD. Since it was not possible in a study of this nature to assess participants prior to the trauma they experienced, or very soon (i.e. minutes or hours) afterwards, it was not feasible to investigate variables that *predicted* the onset of PTSD. Nevertheless, it was possible to use hierarchical regression analysis to investigate what variables accounted for a unique proportion of variance in initial PTSD symptomatology. As stated previously, variables found to be significant correlates of PTSD at two to four weeks were entered into the model in the following steps:

1. Objective index of trauma severity (admission),

2. Subjective indices of trauma severity (subjective threat items),
3. Memory quality (as assessed by the MMQ), and
4. Cognitive and psychosocial variables (other than memory quality) assessed at two to four weeks (cTCQ reappraisal and social support, RSQ, CASI, and the MCQ).

The results of this regression analysis are displayed in Table 7.3.

The objective index of trauma severity, admission to hospital, failed to account for any variance in RIES-C scores at two to four weeks. The model was greatly enhanced by subjective indices of trauma severity in the second step and memory quality in the third step, and to a lesser degree, the various cognitive styles assessed at this time point. The overall model accounted for 76% of variance in RIES-C scores at this time point.

Table 7.3. Regression model of variables contributing to RIES-C scores at two to four weeks

Predictor variables entered	Model				Step				Beta Coefficients (Step 4)
	R^2	F	df	p	R^2 change	F	df	p	
Step 1: Objective trauma severity index	.01	.43	1, 82	.516	.01	.43	1, 82	.516	
Admission to hospital									-.08
Step 2: Subjective trauma severity indices	.34	7.93	5, 78	.001	.33	9.77	4, 78	.001	
"I really thought I was going to die"									.01
"I thought that I was going to be very badly hurt"									.04
"I was really scared"									.21**
"I was scared that someone else might get badly hurt"									.18**
Step 3: Memory quality	.69	28.89	6, 77	.001	.36	88.94	1, 77	.001	
MMQ									.44****
Step 4: Cognitive processes assessed at 2-4 weeks	.76	20.18	11, 72	.001	.06	3.69	5, 72	.005	
cTCQ reappraisal									-.03
cTCQ social support									-.06
RSQ									.25*
CASI									.17^{+}
MCQ									-.05

Note: RIES-C = Revised Impact of Event Scale, child version; MMQ = Memory Modality Questionnaire; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire; CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale.

$^{+}$ <.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

7.3.2 Regression models: The ability of cognitive processes to account for PTSD at six months

Regression modelling was used to investigate the unique variance in PTSD scores at six-month follow-up accounted for by each of the trauma-related, demographic, and cognitive variables assessed. Each model was conducted twice, once with RIES-C scores as the outcome variable, and once with CPSS scores as the outcome variable, in order to further verify the appropriateness of the model tested.

The results of the first analysis, conducted with RIES-C scores as the outcome variable, are displayed in Table 7.4. Subjective indices of threat, memory quality, and cognitive processes assessed at the three-month follow-up each significantly improved the ability of the regression model to explain variance in RIES-C scores at six months post-trauma. The proportion of variance accounted for by cognitive processes assessed at the initial assessment tended towards significance. The model produced accounted for 72% of variance in RIES-C scores at the six-month follow up. However, the limited number of participants who completed the three-month follow-up assessment meant that the model had greatly reduced power (as evidenced by the small degrees of freedom and the failure of any individual variable except the thought suppression item to have a statistically significant beta coefficient).

Table 7.4 Regression model of variables predicting RIES-C scores at six month follow-up

Predictor variables entered	Model				Step				Beta Coefficients (Step 5)
	R^2	F	df	p	R^2 change	F	df	p	
Step 1: Objective trauma severity index	.02	.91	1, 37	.346	.02	.91	1, 37	.346	
Admission to hospital									.01
Step 2: Subjective trauma severity indices	.27	2.42	5, 33	.057	.24	2.75	4, 33	.045	
"I really thought I was going to die"									-.03
"I thought that I was going to be very badly hurt"									.00
"I was really scared"									.09
"I was scared that someone else might get badly hurt"									-.06
Step 3: Memory quality:	.41	3.63	6, 32	.007	.14	7.35	1, 32	.011	
MMQ									-.22
Step 4: Cognitive processes assessed at 2-4 weeks:	.58	3.43	11, 27	.001	.18	2.31	5, 27	.072	
cTCQ reappraisal									.15
cTCQ social support									-.01
RSQ									.30
CASI									.19
MCQ									.05
Step 5: Cognitive processes at 3 months:	.72	4.38	14, 24	.001	.14	3.86	3, 24	.022	
cPTCI total score									.02
Thought suppression item									.62**
Rumination items total									-.06

Note. RIES-C = Revised Impact of Event Scale, child version; MMQ = Memory Modality Questionnaire; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire; CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale; cPTCI = child version of Post-Traumatic Cognitions Inventory. $^{+}$ <.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

In order to overcome this shortcoming, the analysis was repeated but without the variables from the three month follow-up. In the resultant model, the objective index of trauma severity (admission to hospital) again failed to significantly enhance the model, while the amount of variance explained by the model was significantly improved by the subjective indices of trauma severity step (R^2 change = .24, F = 4.25, df = 4, 51, p<.005), the memory quality step (R^2 change = .14, F = 11.48, df = 1, 50, p<.001), and the cognitive variables assessed at the two to four week assessment step (R^2 change = .18, F = 3.85, df = 4, 45, p<.005). The total model accounted for 58% of variance in RIES-C scores at the six month follow up assessment. Only RSQ, the measure of ruminative style, had a significant beta coefficient in the final step of the model (beta = .37, t = 2.40, p<.021).

The hierarchical regression model conducted with CPSS as the outcome variable is displayed in Table 7.5. Entering memory quality, cognitive processes assessed at two to four weeks, and cognitive processes assessed at six months significantly improved the proportion of variance in CPSS scores explained by the model, and resulted in an significant overall model of CPSS scores which accounted for 77% of variance. Neither objective nor subjective indices of trauma severity added to this model. The RSQ and the thought suppression item (assessed at three months) were found to possess significant beta coefficients.

Table 7.5 Regression model of variables predicting CPSS scores at six month follow-up

Predictor variables entered	Model				Step				Beta Coefficients (Step 5)
	R^2	F	df	P	R^2 change	F	df	p	
Step 1: Objective trauma severity index	.06	2.35	1, 37	.134	.06	2.35	1, 37	.134	
Admission to hospital									.11
Step 2: Subjective trauma severity indices	.19	1.57	5, 33	.197	.13	1.35	4, 33	.273	
"I really thought I was going to die"									-.16
"I thought that I was going to be very badly hurt"									.11
"I was really scared"									-.03
"I was scared that someone else might get badly hurt"									-.09
Step 3: Memory quality:	.34	2.72	6, 32	.030	.15	7.04	1, 32	.012	
MMQ									-.18
Step 4: Cognitive processes assessed at 2-4 weeks:	.61	3.85	11, 27	.002	.27	3.80	5, 27	.010	
cTCQ reappraisal									-.01
cTCQ social support									.00
RSQ									.47*
CASI									.07
MCQ									-.03
Step 5: Cognitive processes at 3 months:	.77	5.88	14, 24	.001	.16	5.78	3, 24	.004	
cPTCI total score									.13
Thought suppression item									.64**
Rumination items total									-.03

Note. CPSS = Child Post-traumatic Stress Scale; MMQ = Memory Modality Questionnaire; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire; CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale; cPTCI = child version of Post-Traumatic Cognitions Inventory. $^{+}$ <.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

As with RIES-C scores, however, the small number of participants who completed the questionnaire battery at three months reduced the power of the model, as indicated by the low degrees of freedom. The analysis therefore was repeated but only variables from the assessment at two to four weeks post-trauma were included. The steps where objective and subjective indices of trauma severity were entered into the model approached significance (R^2 change = .06, F = 3.43, df = 1, 54, p<.069, and R^2 change = .13, F = 2.04, df = 4, 50, p<.103, respectively) but did not enhance the variance explained by the model. The model was significantly enhanced by the memory quality step (R^2 change = .15, F = 10.78, df = 1, 49, p<.002), and the cognitive processes at two to four weeks step (R^2 change = .27, F = 6.19, df = 5, 44, p<.001), resulting in a model where 61% of variance in CPSS scores at six months was explained by the entered variables. Only the RSQ was found to have a significant beta coefficient in the final step of the model (beta = .64, t = 4.23, p<.001).

Given the difficulty of including within the above analyses variables assessed at the three-month follow-up, further analyses were conducted to examine whether cognitive processes assessed at three months would on their own predict PTSD at six months post-trauma. In the first hierarchical regression analysis conducted, RIES-C scores at six months were used as the dependent variable. Both post-traumatic appraisals (as assessed by the cPTCI total score) in the first step (R^2 change = .38, F = 22.56, df = 1, 37, p<.001) and thought suppression and trauma-related rumination in the second step (R^2 change = .26, F = 12.20, df = 2, 35, p<.001) significantly improved the model produced. Significant beta coefficients were observed for the cPTCI total score (beta = .30, t = 2.38, p<.023) and the thought suppression item (beta = .54, t = 3.88, p<.001) in the final model.

In the second analysis conducted, CPSS scores at six months were used as the dependent variable. Again both post-traumatic appraisals in the first step (R^2 change = .49, F = 35.27, df = 1, 37, p<.001) and thought suppression and trauma-related rumination in the second step (R^2 change = .18, F = 9.19, df = 2, 35, p<.001) each significantly improved the ability of the model to predict PTSD at six months post-trauma. Significant beta coefficients were observed for the cPTCI

total score (beta = .45, t = 3.69, p<.001) and the thought suppression item (beta = .46, t = 3.52, p<.001).

7.3.3 Regression models: The ability of cognitive processes to account for PTSD at six months over and above PTSD at two to four weeks

Having established that cognitive variables assessed at two to four weeks were predictors of PTSD at six months, it was decided to investigate whether these variables would predict at six months over and above PTSD at two to four weeks. This further investigation was thought necessary, as the aim of this set of analyses was to investigate what processes are involved in the maintenance of PTSD, as opposed to the onset of PTSD.

Given the large proportion of variance in initial RIES-C scores accounted for by the MMQ, and the hypothesis that memory quality is involved in the onset rather than the maintenance of PTSD, an initial regression analysis was conducted to see whether the MMQ would account for any variance in RIES-C scores at six months over and above RIES scores at two to four weeks. This analysis revealed that the MMQ failed to account for any variance in RIES-C scores at six months over and above initial RIES-C scores, supporting the hypothesis. Having established that the MMQ is involved in the onset and not the maintenance of PTSD, this variable was not examined in the following analyses.

In order to examine the role of the other cognitive processes in the maintenance of PTSD, initial RIES-C scores and cognitive processes assessed at two to four weeks were entered into a hierarchical regression model with six-month RIES-C scores as the dependent variable. The analysis was conducted only once with RIES-C scores at six months as the dependent variable, as CPSS scores were not assessed at both two to four weeks and six months. The results of this analysis are displayed in Table 7.6.

Table 7.6 Regression model of variables predicting RIES-C scores at six-month follow-up over and above RIES-C scores at two to four weeks

Predictor variables entered	Model				Step				Beta Coefficients (Step 3)
	R^2	F	Df	P	R^2 change	F	df	p	
Step 1: Initial PTSD symptomatology	.62	91.27	1, 56	.001	.62	91.27	1, 56	.001	
RIES-C at 2-4 weeks									.61****
Step 2: Cognitive processes assessed at 2-4 weeks	.67	17.56	6, 51	.001	.05	1.69	5, 51	.153	
cTCQ reappraisal									.01
cTCQ social support									.15+
RSQ									.07
CASI									.09
MCQ									.09

Note. RIES-C = Revised Impact of Event Scale, child version; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire (rumination); CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale. + <.1, * p<.05, ** p<.01, *** p<.001, **** p<.0001

As would be expected, initial RIES-C made a significant contribution to the model, alone accounting for 62% of variance in RIES-C scores at six months. The various cognitive processes assessed at two to four weeks (endorsing reappraisal and social support as a way of coping with intrusive memories and thoughts, a ruminative style, a fearful attitude towards anxious symptoms, and endorsing worry as a positive coping strategy) failed to enhance significantly the model, over and above initial PTSD symptomatology. Social support was found to have a positive beta coefficient that approached significance.

It was similarly questioned whether the variables assessed at three months would predict PTSD at six months over and above initial RIES-C scores as assessed at two to four weeks post-trauma. Given the limited number of participants who completed the questionnaire battery at three months, it was decided to investigate the role of these variables separately from the other cognitive processes assessed at two to four weeks so as to maximise the power available for regression analysis.

As in the previous analysis, RIES-C scores at two to four weeks were entered in the first step of a hierarchical regression analysis, and accounted for a significant proportion of variance in RIES-C scores at six months (R^2 change = .62, F = 60.30, df = 1, 37, $p<.001$). In the second step, the cPTCI total score at three months failed to improve the model (R^2 change = .01, F = 1.31, df = 1, 36, p=.259). In the third step, thought suppression and trauma-related rumination were found to significantly enhance the regression model over and above previous steps (R^2 change = .08, F = 4.59, df = 2, 34, $p<.017$). Significant beta coefficients were observed for RIES-C scores at two to four weeks (beta = .44, t = 3.02, $p<.005$), and the thought suppression item (beta = .37, t = 2.72, $p<.010$).

7.4 Relationships between cognitive styles and trauma-specific maladaptive coping strategies and appraisals

The analyses presented above suggest that a variety of cognitive processes are involved in the maintenance of PTSD, with the result that the disorder takes a chronic course. Certain cognitive processes assessed at two to four weeks and at

three months post-trauma were found to predict PTSD at six months over and above initial PTSD. As the variables assessed at the two to four week assessment related to more general, non-trauma specific attitudes and styles, and the variables at three months to more trauma-specific coping strategies, it was decided to investigate whether the former processes, assumed to relate to potentially maladaptive styles and attitudes, would predict the latter psychopathological behaviours.

Correlations between the various processes identified as significant predictors of PTSD at six months are displayed in Table 7.7. Each cognitive style assessed at two to four weeks, in particular the CASI, was significantly correlated with scores on the thought suppression item at three months. Both the distraction item and the total score for the three rumination items were significantly correlated with the cTCQ reappraisal sub-scale, the RSQ, the CASI, and the positive beliefs sub-scale of the MCQ.

Table 7.7 Correlations between cognitive processes assessed at two to four weeks and at three months post-trauma

	Cognitive processes at 3 months		
Cognitive Processes at 2-4 weeks	Thought suppression item	Distraction item	Rumination (sum of 3 items)
CTCQ reappraisal	.32*	.46**	.45**
CTCQ social support	.34*	.29	.24
RSQ	.39*	.39*	.53***
CASI	.51***	.50***	.57****
MCQ	.36*	.45**	.55***

Note: cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire (rumination); CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, child version of positive beliefs about worry sub-scale.
* = p<.05, ** = p<.01, *** = p<.001, **** = p<.0001

Three further points are to be noted from this table. Firstly, reappraisal as a strategy for coping with non-trauma specific intrusive thoughts and memories was significantly correlated with rumination, suggesting that attempts to reappraise a trauma do not necessarily result in satisfactory resolution. Secondly, RSQ scores, while being significantly correlated with each of the cognitive processes assessed at three months that were implicated as being predictors of later PTSD, appeared

to be more strongly correlated with the trauma-specific rumination items than with the thought suppression and distraction items. Thirdly, the CASI was the strongest predictor of each of the three cognitive processes assessed at three months post-trauma that were identified as being maladaptive.

7.5 Regression models of depression

A final set of regression analyses were conducted so as to examine whether the processes hypothesised to be related to the onset and maintenance of PTSD also would have a role in the aetiology of post-traumatic depression. Having established that objective indices of trauma severity were unrelated to PTSD it was not thought necessary to retain this variable for these analyses, while the role of the other variables assessed (subjective indices of trauma severity, memory quality, ruminative style, thought control strategies, fear of the symptoms of anxiety, endorsement of worry as a positive strategy, and negative trauma appraisals) in the onset and maintenance of depressive responses to the trauma was examined.

In order to investigate which processes were involved in the onset of depression following the experienced trauma, a regression analysis was conducted with BDSRS scores at the two to four week assessment point as the dependent variable. Subjective indices of trauma severity ("I really thought I was going to die", etc.) were entered in the first step of the model, significantly contributing to the model and accounting for a large proportion of variance (R^2 change = .20, F = 4.85, df = 4, 79, p<.001). Memory quality, entered in the second step, significantly accounted for a similar proportion of variance (R^2 change = .21, F = 27.56, df = 1, 78, p<.001). Scores on the reappraisal and social support scales of the cTCQ, the RSQ, the CASI and the positive beliefs sub-scale of the MCQ were entered on the third step and again significantly accounted for variance in BDSRS scores at two to four weeks (R^2 change = .14, F = 4.47, df = 5, 73, p<.001). Significant beta coefficients revealed that the "I was really scared" item (beta = .21, t = 2.13, p<.036), the reappraisal sub-scale of the cTCQ (beta = -.24, t = -.2.28, p<.025), and the RSQ (beta = .48, t = 3.77, p<.001) were significant contributors to the model produced. In this model, therefore, reappraisal was negatively related to

depression, rather than being positively related to it. In total, the variables entered accounted for 55% of variance in BDSRS scores at the initial, two to four week assessment point.

In order to investigate whether those processes hypothesised to be involved in the maintenance of PTSD were also involved in the maintenance of depression following trauma, a regression analysis was conducted with BDSRS scores at the six month assessment point as the dependent variable, and BDSRS scores at two to four weeks entered in the first step. Not surprisingly, this first step significantly accounted for a very large proportion of variance in BDSRS scores at six months (R^2 change = .44, F = 29.06, df = 1, 37, p<.001). Cognitive processes assessed at the two to four week assessment, entered in the second step (R^2 change = .05, F = .63, df = 5, 32, p=.677), and cPTCI total score, thought suppression, and rumination items, entered in the third step (R^2 change = .09, F = 2.11, df = 3, 29, p=.121), failed to account for additional variance in BDSRS scores at six months. With all steps entered into the model, inspection of beta coefficients for each variable revealed that initial BDSRS (beta = .43, t = 2.21, p<.034), and the thought suppression item (beta = .43, t = 2.46, p<.020), were significant contributors to the model. The overall model accounted for 58% of variance in BDSRS scores at six months post-trauma.

However, there was concern that this analysis may have had insufficient power due to the inclusion of so many variables and the small number of participants returning the three-month questionnaires. In view of this, a further regression was conducted, with only cognitive processes assessed at 3 months entered in the second step. The model was enhanced by initial BDSRS scores (R^2 change = .44, F = 29.06, df = 1, 37, p<.001), but not by cognitive processes assessed at the three month follow up (R^2 change = .09, F = 2.07, df = 3, 34, p<.123). The slight improvement in power did not reveal any further variables that individually contributed to the model beyond the BDSRS (beta = .43, t = 2.30, p<.027), and the thought suppression item (beta = .38, t = 2.31, p<.027).

7.6 Summary and discussion

A prospective study of children and adolescent's responses to assaults and RTAs was undertaken, and an investigation into the cognitive processes involved in the onset and maintenance of PTSD was conducted. Regression and correlational analyses were used to investigate whether a number of cognitive processes were associated with PTSD, and whether such processes were greater predictors of PTSD at six months than demographic and trauma-related variables.

Age and sex were not correlated with PTSD at any of the three time points when participants completed assessments. Admission to hospital following the trauma was a correlate of PTSD at three and six months post-trauma. While admission to hospital might be viewed in part as an index of objective trauma severity, there exists the possibility that this refers to additional exposure. Each of the subjective indices of trauma severity were found to be significant correlates of PTSD at each time point, as were most items assessing dissociation and confusion. Anger directed towards the individuals responsible for causing the traumatic event was not found to be related to PTSD, but self-directed anger was, being significantly correlated with PTSD at each time point.

Of the cognitive processes assessed at two to four weeks post-trauma, memory quality (as assessed by the MMQ), the use of reappraisal and social support in coping with intrusive thoughts and memories (as assessed by the reappraisal and social sub-scales of the cTCQ), a ruminative style (as assessed by the RSQ), negative and fearful responses towards the symptoms of anxiety (as assessed by the CASI), and endorsing worry as a positive coping strategy (as assessed by the positive beliefs about worry sub-scale of the MCQ) were significant correlates of PTSD at each time point, while a negative attitude towards emotional expression (as assessed by the AEE) and using distraction to cope with intrusive thoughts and memories (as assessed by the distraction sub-scale of the cTCQ) were not found to be correlated consistently with PTSD. Of the cognitive processes assessed at three months, both a sense of permanent and disturbing change and of being a feeble person in a scary world (as assessed by the sub-scales of the cPTCI), ongoing anger towards those responsible for the trauma, omen formation, thought suppression and distraction as a way of coping with intrusive memories of the

trauma, and trauma-related rumination were significant correlates of PTSD at three months and at six months.

The various processes assessed at two to four weeks and three months that initially were found to be correlated with PTSD were entered into regression models. Admission to hospital failed to improve such models significantly. Subjective indices of trauma severity (i.e. items assessing subjective threat) significantly contributed to a regression model of PTSD at the two to four week assessment, and a model of PTSD at six months when the RIES-C was used at the dependent variable, but not when the CPSS was used.

Regression analysis was used to examine which variables assessed at two to four weeks would account for variance in RIES-C scores at this time point. Indices of trauma severity, memory quality, and to a lesser degree, the cognitive processes assessed, accounted for variance in two to four week RIES-C scores. This analysis suggests that appraisal of trauma severity, memory quality, and a variety of cognitive styles play a role in the onset of PTSD in children and adolescents.

Further regression analyses were conducted to examine the role of the cognitive processes assessed in the maintenance of PTSD. Memory quality was ruled out as having any role in the maintenance of PTSD. Cognitive processes assessed at two to four weeks and at three months, however, contributed to models of PTSD at six months. More rigorous tests of whether cognitive processes were involved in the maintenance of PTSD also were conducted. In these regression analyses the ability of various cognitive processes to predict PTSD at six months over and above initial PTSD levels was examined. In each analysis initial PTSD accounted for a significant proportion of variance (62%) in RIES-C scores at six months. In the first analysis, cognitive processes assessed at two to four weeks were entered in the second step of the model, but failed to account for any variance over and above initial PTSD. In the second analysis conducted, post-traumatic appraisals, entered in the second step, failed to account for any variance, while thought suppression and trauma-related rumination, entered in the third step, significantly accounted for further variance over and above initial PTSD.

An exploratory investigation was conducted into the relationships between non-trauma-specific attitudes, cognitive styles, and thought control strategies assessed at two to four weeks and the trauma-specific items assessing thought suppression, distraction, and rumination assessed at three months. The CASI was found to be the strongest predictor of the maladaptive strategies hypothesised to be responsible for maintaining PTSD, and the RSQ, while significant correlated with each of the processes at three months, was particularly strongly correlated with the rumination items.

Regression analyses were conducted to examine whether the cognitive processes hypothesised to be involved in the aetiology of PTSD also would play a role in depressive responses to trauma. Subjective indices of trauma severity, memory quality, and the cognitive processes assessed at the two to four week assessment (in particular the measures assessing ruminative or reappraisal cognitive styles) significantly contributed to a regression model of depression at this time point. This suggests that the same processes involved in the onset of PTSD were also involved in the onset of depression. Only thought suppression (assessed at three months) was found to predict depression at six months, over and above the effect of initial depression.

The findings presented in this chapter suggest that the cognitive processes investigated do play a role in the aetiology of PTSD in children and adolescents. The role of these processes was found to be greater than that of subjective appraisal of trauma severity and admittance to hospital, and considerably greater than that of demographic variables and a history of trauma exposure or emotional disorder. In addition, it was possible to distinguish between processes involved in the onset and maintenance of PTSD. The critical process in this regard was memory quality, which was related to the onset of PTSD but did not account for variance in PTSD at the six month follow up over and above initial PTSD.

The cognitive processes assessed were also found to play a role in the onset, and to a lesser degree, the maintenance of depressive disorder. A degree of specificity was observable, however; memory quality appeared to play a greater role in the onset of PTSD than it did in depression (36% of variance versus 20%), while the

cognitive processes assessed at two to four weeks appeared to account for a greater proportion of variance in initial depression than in initial PTSD (14% of variance versus 6% of variance).

The finding that negative appraisals of anxious symptoms predicted with maladaptive cognitive coping strategies at three months mirrors the finding of Steil and Ehlers (2000) who reported a relationship between negative appraisal of PTSD symptoms and maladaptive coping strategies. The relationship between the various non-trauma related cognitive styles assessed at two to four weeks and maladaptive trauma-related coping strategies at three months does suggest that there is a mechanism by which pre-trauma emotional disorder might increase the risk of PTSD. However the absence of a relationship between pre-traumatic emotional disorder and PTSD prevents a full examination of this hypothesis. The failure to observe a relationship between pre-traumatic emotional disorder and PTSD contradicts the findings of Asarnow et al. (1999) and La Greca et al. (1998), and suggests that the method used to assess prior emotional disorder was too insensitive.

A further methodological criticism that may be made of this study is that the MMQ, the measure used to assess memory quality, is simply an index of PTSD, and that its constituent items overlap with individual PTSD symptoms. This possibility is discounted by the fact that the items of the MMQ refer exclusively to the quality of intrusive memories of the trauma, and not to the frequency of intrusive memories of the trauma. It is possible that the MMQ has a descriptive rather than explanatory role, i.e. it identifies the kinds of memories that are likely to be involved in PTSD, but does not address how such memories come into being.

Chapter 8: The relationship between parental and child responses to trauma in families participating in Study 2, a prospective study of children and adolescents' responses to assaults and RTAs

A number of studies have found that parental responses to trauma have an effect on their children's responses to the trauma (Green et al., 1991; Korol et al., 1999; McFarlane, 1987a; Smith et al., 2001; Wolmer et al., 2000). As noted in chapter 1, how parental post-traumatic stress and other psychopathology (such as depression) impact on children's responses to trauma has yet to be fully explored.

An investigation was conducted therefore into the mechanisms by which parental psychopathology may impact upon child post-traumatic stress, within the context of Study 2, a prospective study of children and adolescents exposed to assaults and road traffic accidents. One parent of each child (typically the child's mother) completed the same questionnaires as their children, but in their adult form. Those cognitive processes identified in the previous chapter as being related to the onset and maintenance of PTSD were examined to see if there would be any correlation between parent and child endorsement of these processes. It also was considered pertinent to investigate whether the relationship between parental psychopathology and child PTSD would be replicated within this sample, and whether parental endorsement of those cognitive processes identified in the previous chapter as being maladaptive would be related to their own psychopathology and their child's PTSD.

Parents completed the PDS, a self-report measure of PTSD, and the MMQ, a measure of the quality of the individual's memories of a traumatic event, with regards to their exposure to the trauma their child experienced. The degree of exposure varied widely between participating families; some parents were involved directly in the same event (e.g. both were sat in a car that crashed), others witnessed the trauma happen or saw the immediate aftermath of the trauma (e.g. a mother who was quickly alerted to her child being struck by a car and seeing her child unconscious on the ground), and some were called and asked to attend the A&E department where their child had been taken following either an assault or RTA. In cases where parents did not find out about their child's assault

or RTA until some time afterwards, parents did not complete either the PDS or the MMQ. Direct parental exposure was included in several of the analyses conducted in this chapter, where level of exposure was dichotomously coded (i.e. direct exposure to the trauma or no direct exposure to the trauma).

Given the attrition in the questionnaire completion rate with successive assessments and the heavy use of regression analyses in the previous chapter, and the corresponding loss of power for further regression analyses, it was decided to use correlational analyses as the principal statistical tool within this chapter. As the analyses conducted in this chapter are more exploratory, it was decided to adopt a more conservative level of significance than in previous chapters (α=.01). In addition to parental post-traumatic stress, parental depression and anxiety were also examined. The parental cognitive processes selected for investigation in this chapter, based on findings from the previous chapter, were anxiety sensitivity (assessed by the ASI), general ruminative style (assessed by the RSQ), positive beliefs towards worry (assessed by the appropriate sub-scale of the MCQ), thought control strategies (as assessed by the sub-scales of the TCQ), and memory quality (assessed by the MMQ). In addition to these variables assessed at the two to four week time point, trauma-specific thought suppression, distraction, and rumination at the three month assessment point were also examined. Furthermore, the items of the family functioning questionnaire, used by McFarlane (1987b) to investigate adaptive and maladaptive intra-familial coping, were included for the present analyses. Where correlational analyses were used to investigate the effect of parental cognitive styles, coping strategies, and psychopathology on child PTSD, the outcome measures used were the RIES-C and the CPSS.

8.1 Parental psychopathology over time

Before examining the relationships between parental and child variables, some consideration of the impact on parents of their child's trauma (and in a few cases their own trauma as well) is warranted. Table 8.1 shows the mean scores of parents on the PDS, BDI, and the state sub-scale of the STAI at each time point.

A within-subjects ANOVA revealed there to be a significant main effect of time for scores on the PDS ($F = 8.23$, $df = 2, 44$, $p<.001$). T-tests revealed significant differences in PDS scores between the two to four week and three months time points ($t = 2.58$, $df = 29$, $p<.05$), and between the two to four week and six month time points ($t = 4.47$, $df = 32$, $p<.0001$), but not between the three month and six month assessments. With regards to depressive symptomatology, a main effect of time for BDI scores was observed also ($F = 8.23$, $df = 2, 44$, $p<.001$). T-tests showed no significant differences between the two to four week and three month assessments, or between the three and six month assessments, but a significant difference between two to four week and six months was found ($t = 3.20$, $df = 35$, $p<.01$). Anxious symptomatology scores, as assessed by the state anxiety sub-scale of the STAI, also were subjected to ANOVA. No main effect of time point was observed.

Table 8.1 Parental psychopathology by time point

	Mean Score (Standard Deviation)		
Time point	PDS	BDI	STAI
2-4 weeks (n=59)	13.12 (11.54)	7.63 (9.21)	36.44 (13.10)
3 months (n=37)	6.68 (8.62)	4.32 (4.67)	37.14 (11.84)
6 months (n=42)	5.81 (8.74)	3.95 (6.91)	34.89 (14.11)

Note. PDS = Posttraumatic Stress Diagnostic Scale; BDI = Beck Depression Inventory; STAI = State Trait Anxiety Inventory.

To the investigator's knowledge no data for the PDS in non-clinical populations is available. The parents' mean score on the BDI at the initial two to four week assessment was found to be below the cut-off used for mild depression (Beck & Beamesderfer, 1974), and similar to the level of depression observed in a large population of mothers exposed to civil war in Bosnia-Hercegovina (Smith et al., 2001). At the follow up assessments, however, parental symptomatology dropped below the levels exhibited in this sample of mothers. Parents' scores on the state anxiety sub-scale of the STAI at two to four weeks and three months was slightly higher than normative data for American women (mean = 35.21; Spielberger et al., 1983), but very slightly lower than these levels at the six month follow up.

8.2 Relationships between parent and child psychopathology

Correlations between parent and child measures of post-traumatic stress and depressive and anxious psychopathology at each time point are displayed in Table 8.2.

Table 8.2 Correlations between parent and child psychopathology by time point

Child Psychopathology	Parent Psychopathology								
	2-4 weeks			3 months			6 months		
	PDS	BDI	STAI	PDS	BDI	STAI	PDS	BDI	STAI
2-4 weeks:		(n=58)			(n=34)			(n=38)	
RIES-C	.27	.40**	.32	.21	.17	.16	.36	.37	.17
BDSRS	.25	.37*	.34*	.26	.07	.11	.29	.38	.27
3 months:		(n=29)			(n=35)			(n=26)	
RIES-C	.17	.40	.23	.33	.24	.18	.17	.29	.09
CPSS	.21	.42	.25	.32	.27	.18	.08	.28	.02
BDSRS	.28	.34	.22	.16	.00	-.02	-.10	.10	-.16
RCMAS	.10	.41	.15	.02	.01	-.09	.00	.15	-.19
6 months:		(n=40)			(n=29)			(n=41)	
RIES-C	.31	.40*	.25	.23	.19	.05	.48*	.49*	.39
CPSS	.34	.39*	.17	.16	.20	-.01	.36	.43*	.26
BDSRS	.29	.32	.09	-.10	.02	-.16	.31	.39	.22
RCMAS	.38	.39*	.14	.05	.01	-.14	.39	.42*	.22

PDS = Posttraumatic Stress Diagnostic Scale; BDI = Beck Depression Inventory; STAI = State anxiety sub-scale of the State Trait Anxiety Inventory; BDSRS = Birleson Depression Self-Rating Scale; RIES-C = Revised Impact of Event Scale, child version; CPSS = Child Post-traumatic Symptom Scale; RCMAS = Revise Child Manifest Anxiety Scale.
* = <.01, ** = <.001

Parental depression at the two to four week assessment was found to correlate with child PTSD and depression at the same assessment point, and to predict child PTSD (as assessed by both the RIES-C and the CPSS) and anxiety at the six month assessment. Parental anxiety was correlated with initial child depression, but failed to predict any later psychopathology. Relationships with any of the three-month variables were non-significant, though this is likely to be due to the

poor completion rate of the three-month questionnaire battery. Parental depression and PTSD at the six month assessment were significantly correlated with child PTSD at this assessment point, while parental depression was also significantly associated with child anxiety. No other significant associations were observed.

8.3 Relationships between parent and child objective and subjective indices of trauma severity

Correlations between parent and child objective and subjective indices of trauma severity are displayed in Table 8.3.

Table 8.3 Pearson's Product Moment Correlations between parent and child objective and subjective indices of trauma severity

	Parent variables	
	Objective index of trauma severity: Direct exposure (n=58)	Subjective index of trauma severity: "I was really scared" (n=54)
Child variables:		
Objective indices of trauma severity:		
Fracture	-.12	-.17
Admitted	-.02	.22
Triage	-.04	.07
Subjective indices of trauma severity:		
"I really thought that I was going to die"	-.11	.21
"I thought that I was going to be very badly hurt"	-.03	.19
"I was really scared"	-.11	.10
"I was scared that someone else might get badly hurt""	.03	.30
Parent variables:		
Subjective index of trauma severity:		
"I was really scared"	.13	-

A trend towards a relationship between a child being admitted to hospital and parent subjective trauma severity was noted, but this failed to reach significance. Children were not more distressed by the presence of a parent in the same trauma.

A single significant correlation was observed between parental subjective trauma severity and the child item assessing fear that someone else might be hurt. No significant relationships between parent and child objective and subjective indices of trauma severity. These data suggest that child appraisals of the severity of a trauma were not affected by either their parent's exposure to the same trauma, or their parent's appraisal of the severity of the trauma.

8.4 Relationships between parent and child cognitive styles and coping strategies

Correlations between parent and child responses on those cognitive styles and coping strategies found in chapter 7 to be significant predictors of child PTSD are displayed in Table 8.4.

The relationships between parent and child responses on the same measure (or an age-appropriate version in the case of children) were predominantly non-significant. Parental endorsement of worry as a positive strategy was significantly correlated with child anxiety sensitivity (as measured by the CASI). In addition, parent scores on the MMQ were significantly correlated with several of the child cognitive style measures (the social support sub-scale of the cTCQ, the RSQ, and the CASI), though why this should be the case is more difficult to explain, since the MMQ is a measure of aspects of the memory of the event experienced, and not a cognitive style as such.

Table 8.4 Correlations between parent and child cognitive styles and coping strategies

		Parental cognitive styles and coping strategies									
		2-4 weeks							3 months		
Child cognitive styles and coping strategies		MMQ	TCQ distract	TCQ social support	TCQ reappraisal	RSQ	ASI	MCQ	Thought suppress item	Distract item	Ruminate (sum of 3 items)
2-4 weeks	MMQ	.27	.17	.04	-.12	.25	.23	.30	-	-	-
	cTCQ distract	-.14	.20	.20	.16	.06	.07	.01	-	-	-
	cTCQ social support	.52**	.13	.20	.11	.18	.19	.20	-	-	-
	cTCQ re-appraisal	.33	.06	.07	-.06	.12	.11	.24	-	-	-
	RSQ	.40*	-.02	-.13	-.33	.14	.13	.28	-	-	-
	CASI	.44*	.15	.01	-.21	.19	.23	.37*	-	-	-
	MCQ	.27	.13	.16	-.05	.22	.16	.23	-	-	-
3 months	Thought suppress item	.18	.44	.27	-.01	.33	.20	.15	.13	.10	.34
	Distract item	.27	.41	.20	.04	.30	.15	.18	.23	.24	.43
	Ruminate (sum of 3 items)	.13	.36	.32	.03	.07	-.13	.16	.18	.24	.41

Note: N=50. MMQ = Memory Modality Questionnaire; cTCQ = Thought Control Questionnaire, child version; RSQ = Response Styles Questionnaire (rumination); CASI = Childhood Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, positive beliefs about worry sub-scale; ASI = Anxiety Sensitivity Inventory.
* = <.01, **= <.0001

8.5 Parental cognitive styles and coping strategies as correlates and predictors of parental PTSD and depression

Correlational analyses were used to examine the relationships between parental cognitive styles and coping strategies and parental psychopathology (see Table 8.5). Direct exposure to the trauma was not related to depression or PTSD at any assessment point. The subjective index of trauma severity item was a correlate of PTSD at the initial assessment, but failed to predict PTSD at six month follow up, or depressive psychopathology. Memory quality, as assessed by the MMQ, was found to be a significant correlate of PTSD at the initial interview, as well as being a significant predictor of PTSD at the three and six month follow up assessments.

Table 8.5. Relationships between parental cognitive styles and coping strategies and depressive and PTSD psychopathology

Parent cognitive styles and coping strategies	Parental Psychopathology					
	2-4 weeks		3 months		6 months	
	BDI	PDS	BDI	PDS	BDI	PDS
2-4 week measures:	(n=47)		(n=28)		(n=30)	
Direct exposure to trauma	.14	.22	.03	-.11	-.13	-.11
"I was really scared" item	.32	.42*	.11	.30	.22	.39
MMQ	.51**	.64***	.22	.70***	.33	.46*
TCQ distract	.12	.10	-.19	.17	-.16	-.22
TCQ reappraisal	-.10	.00	-.10	.04	.07	.03
TCQ social support	.01	.04	-.08	.13	.09	-.11
RSQ	.56***	.41*	.13	.34	.31	.24
ASI	.46**	.36*	.13	.63**	.35	.22
MCQ	.37*	.31	.25	.60**	.11	.18
3 month measures:			(n=36)		(n=27)	
Thought suppression item	-	-	.55**	.52*	.11	.06
Distraction item	-	-	.44*	.47*	.06	.04
Rumination (sum of 3 items)	-	-	.42	.62***	.24	.10
FFQ irritable distress	-	-	.65***	.69***	.59*	.54*
FFQ involvement	-	-	.30	.40	.34	.29
Maternal overprotection	-	-	.38	.53**	.06	.15

MMQ = Memory Modality Questionnaire; TCQ = Thought Control Questionnaire; RSQ = Response Styles Questionnaire (rumination); ASI = Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, positive beliefs about worry sub-scale; FFQ = Family Functioning Questionnaire; PDS = Posttraumatic Stress Diagnostic Scale; BDI = Beck Depression Inventory.

* = <.01, ** = <.001, *** = <.0001

The sub-scales of the TCQ investigated in child participants (the distraction, social support and reappraisal sub-scales) were unrelated to either depressive or PTSD symptomatology at any time point. The RSQ was a correlate of depression and PTSD at the initial time point, but failed to predict later psychopathology. Both the ASI and the positive beliefs sub-scale of the MCQ were also correlates of initial psychopathology, and both measures predicted PTSD symptoms at three months. Neither measure predicted psychopathology at six month follow-up, however.

A number of the coping strategies assessed at the three-month follow up were significantly related to both forms of psychopathology assessed at that time point (thought suppression and distraction, and the irritable distress sub-scale of the FFQ). However, only the irritable distress sub-scale of the FFQ significantly predicted parent psychopathology (both PTSD and depression) at the six-month follow up.

8.6 Parental cognitive styles and coping strategies as correlates and predictors of child PTSD

Correlational analyses were performed between parental cognitive styles and coping strategies and child PTSD at each time point, the results of which are presented in Table 8.6.

The quality of parent's memories were found to be significant correlates of children's PTSD symptoms at the initial assessment, though this may be have been due to the strong correlation between parental PTSD and MMQ scores. Direct parental exposure to the trauma was not related to child PTSD at any time point. The positive beliefs about worry sub-scale of the MCQ was correlated with PTSD at the two to four week assessment, but failed to predict PTSD at later assessments.

Table 8.6 Correlations between parental cognitive styles and coping strategies and child PTSD at each time point

	Child PTSD				
	2-4 weeks	3 months		6 months	
Parent cognitive styles and coping strategies	RIES-C	RIES-C	CPSS	RIES-C	CPSS
2-4 week measures:	(n=53)	(n=26)		(n=35)	
Direct exposure to trauma	.02	-.02	-.02	-.02	.01
"I was really scared" item	.26	.20	.27	.27	.19
MMQ	.36*	.23	.22	.28	.28
TCQ distract	.25	.43	.29	.15	.15
TCQ reappraisal	-.02	-.18	-.16	-.05	-.11
TCQ social support	.02	.21	.20	.20	.17
RSQ	.24	.25	.19	.15	.15
ASI	.22	.07	.09	-.04	-.01
MCQ	.34*	.38	.41	.38	.33
3 month measures:		(n=36)		(n=29)	
Thought suppression item	-	.30	.34	.01	-.03
Distraction item	-	.32	.34	.02	-.04
Rumination (sum of 3 items)	-	.46*	.50*	.23	.17
FFQ irritable distress	-	.32	.37	.24	.21
FFQ involvement	-	.45*	.42*	.26	.18
Maternal overprotection	-	.37	.32	.04	.09

PTSD = Post-Traumatic Stress Disorder; MMQ = Memory Modality Questionnaire; TCQ = Thought Control Questionnaire; RSQ = Response Styles Questionnaire (rumination); ASI = Anxiety Sensitivity Index; MCQ = Meta-Cognitions Questionnaire, positive beliefs about worry sub-scale; FFQ = Family Functioning Questionnaire; RIES-C = Revised Impact of Event Scale, child version; CPSS = Child Post-traumatic Symptom Scale.
* = <.01

Parental rumination and the involvement sub-scale of the FFQ were significantly correlated with concurrent PTSD (as assessed by both the RIES-C and the CPSS), but no measures were predictive of PTSD at the six month assessment.

8.7 Summary

An investigation was conducted into the effect of parent psychopathology and cognitive processes on children's responses following attendance at an A&E department after an assault or RTA. Levels of PTSD and depression in the parents of children exposed to such events were found to have decreased by the follow up assessments, while levels of anxiety were static. Initial parental depression was significantly related to children's PTSD at both the initial assessment and six month follow up.

Of the cognitive processes assessed, no adult and child versions of the same measure were correlated. However, there were relationships between parental memory quality and child use of social support in coping with intrusive memories, a ruminative style, and anxiety sensitivity, as well as an association between parental endorsement of worry as a positive strategy and child anxiety sensitivity.

The onset of parental PTSD following their children's exposure to trauma was related to their own subjective appraisal of threat, memory quality, a general ruminative style, and fear concerning the symptoms of anxiety. Direct exposure did not contribute to parental PTSD scores at any time point. The onset of parental depression was related to memory quality, ruminative style, anxiety sensitivity, and endorsing worry as a positive strategy. Only memory quality was found to relate consistently to parental PTSD at each time point, while family irritable distress was the only variable assessed at three months to be correlated with parental PTSD and depression at both the three-month and six-month follow up assessments. These data suggest that parents can experience some PTSD symptoms following a child's exposure to trauma, and that these symptoms can occur in the absence of direct exposure to the trauma. It is also to be noted, however, that such symptoms are mostly transient and not severe.

Parental endorsement of worry as being a positive coping strategy was a significant correlate of the onset of child PTSD, as was parental memory quality. No parental cognitive processes assessed at either the two to four week or three-month assessment points significantly predicted scores on self-report measures of PTSD at the six-month follow up point.

In conclusion, it would be appear that child responses to trauma are related to responses of their parents. The study undertaken here replicated previous findings that parental psychopathology (in particular parental depression) correlates with child PTSD (Green et al., 1991; Korol et al., 1999; McFarlane, 1987a; Smith et al., 2001; Wolmer et al., 2000), but the mechanisms by which parental and child responses are related remain largely unknown. The small numbers of parents and children who completed the questionnaire booklets at each time point precluded the use of regression analyses, which would have helped to distinguish the role of parental psychopathology and cognitive processes from children's cognitive processes and other psychopathology.

The lack of a relationship between direct parental exposure to the trauma and child PTSD suggests that within this age group children's responses to a trauma are not affected by parental presence during the event. The issue remains as to why depression was the only parental variable consistently to be associated with child PTSD. A depressed parent may simply be less able to offer encouragement to a child following trauma, and less able to encourage the child to adopt more adaptive coping strategies, e.g. resuming a normal routine. The significant relationship between parental endorsement of worry and child anxiety sensitivity does indicate that a significant child psychopathological trait may be modelled, at least partially, on a related maladaptive parental cognitive style.

It is noteworthy that although several significant findings were observed regarding the relationship between child PTSD and parent responses to their child's trauma, the size of the sample investigated was not large. Furthermore, the sizes of the correlations were not very large, e.g. the correlation coefficients between parental depression and child PTSD were no greater than .40, suggesting that no more than 16% of the variance in child PTSD was explained by parental psychopathology.

These findings, especially in light of the previous chapter's findings where child cognitive processes were found to account for a great of variance in PTSD, sharply contrast with the report of McFarlane (1987a) that maternal responses to a bushfire better predicted child PTSD than a child's own exposure. This disparity may be attributable to the reliance on parental report for assessing child PTSD in McFarlane's study.

Chapter 9: General Discussion

The present investigation was directed towards understanding cognitive aspects of PTSD in children and adolescents. Two studies were designed to examine whether cognitive models of PTSD in adults might be usefully applied to children and adolescents. In particular these studies were aimed at testing whether cognitive processes involved in the onset and maintenance of PTSD might be differentiated, and whether cognitive processes might be more responsible for causing PTSD than demographic and trauma-related factors. In this chapter the hypotheses presented for this investigation in section 1.8.3 will be evaluated, limitations of the investigation will be discussed, implications for clinical practice will be outlined, and suggestions for future research will be specified.

9.1 Review of hypotheses

In section 1.8.3 a number of hypotheses were made regarding aspects of children and adolescents' responses to trauma and the aetiology of PTSD, in the context of a theoretical approach to PTSD where much emphasis is placed upon the role of distinct cognitive processes in the onset and maintenance of the disorder. In this section it will be discussed whether these hypotheses were supported by the evidence presented.

9.1.1 Hypothesis 1: PTSD symptomatology will decrease as a function of time

Study 2 comprised a prospective study of children and adolescents' psychological responses to either an assault or an RTA. Details of how participants' PTSD and depressive symptomatology changed over time were presented in chapter 6. PTSD levels, as assessed by semi-structured interview, were found to decrease between the two to four week and six month assessment points. This finding was clarified by responses to self-report questionnaires, where PTSD levels were found to decrease between the two to four week and three month assessments, but not between the three month and six month assessments. This endorsement of hypothesis 1 lends support to an onset-maintenance approach in understanding the aetiology of PTSD in this age group.

9.1.2 Hypothesis 2: Subjective indices of trauma or frightening event severity will account for unique variance in PTSD scores over and above objective indices of trauma severity and other demographic variables

In both Study 1 and Study 2 subjective indices of trauma or frightening event severity were found to account for a significant proportion of variance in PTSD symptomatology over and above demographic and objective trauma-related variables. Indeed, only in Study 1 did age and sex significantly relate to PTSD symptoms, while even then the subjective indices of trauma severity (in this case, how scared, sad, angry, ashamed, and helpless the children described themselves as being during the event) accounted for considerably greater variance. This finding supports previous research in both children (Yule, et al. 1999) and adults (Ehlers, et al. 1998; Dunmore, Clark, & Ehlers, 2001) that subjective estimates of the severity of a trauma are more significant factors than objective estimates of trauma severity (e.g. degree of injury sustained), or demographic variables such as age and sex.

9.1.3 Hypothesis 3: Sensory-based and fragmented memories will be correlated with post-traumatic stress symptoms following a trauma or frightening event

A prominent feature of both Brewin et al. (1996) and Ehlers and Clark's (2000) cognitive models of PTSD in adults is the emphasis placed on the quality of the memories laid down of a trauma in the onset of PTSD. Recent evidence (Halligan et al, 2003) supports this proposal. Very few studies have attempted to examine thoroughly the role of trauma memory in children. In the present study a self-report measure of memory quality was designed and distributed to participants in both a cross-sectional study (Study 1) and a prospective study (Study 2). In each case, scores on this measure of memory quality, the MMQ, accounted for a significant proportion of variance in PTSD scores. In addition, the variance accounted for by the MMQ was distinct from the variance accounted for by either subjective indices of trauma severity, or objective indices of trauma severity and demographic variables.

The strong relationship observed in Study 2 between memory quality and the onset of PTSD, together with the failure of this variable to predict PTSD at six month follow up above and beyond initial PTSD symptomatology, supports the distinction between onset and maintenance processes in the aetiology of PTSD in children and adolescents. Furthermore, the finding that memory quality is an aspect of children and adolescents' responses to trauma that is separate from appraisals of threat and peri-traumatic distress suggests that a single-level account of PTSD, such as the fear conditioning model espoused by Foa, Steketee, and Rothbaum (1989), is inadequate in this age group.

9.1.4 Hypothesis 4: Peri-traumatic dissociation will be correlated with the onset of PTSD symptoms, but to much a lesser extent be predictive of chronic PTSD, while the dissociation criterion of ASD will not significantly enhance the ability of the diagnosis to predict chronic PTSD

In Study 2 dissociative responses to an assault or an RTA were assessed in two ways. ASD, which includes a diagnostic criterion relating to dissociation, was assessed by a semi-structured interview with the investigator, while the battery of self-report questionnaires that participants completed comprised several items pertaining to peri-traumatic dissociation and confusion. The ability of the ASD diagnosis to predict PTSD at six months, investigated in chapter 6, was very good, but the inclusion of the dissociation criterion did not play a noticeable role. While found to be significantly correlated with both the onset of PTSD and a predictor of PTSD at six months, the self-report items assessing dissociation and confusion were not entered in regression models in chapter 7, due to the failure of the dissociation criterion of ASD to predict PTSD over and above over symptoms in the previous chapter, and the need to enhance the power of the regression analyses conducted. It was not therefore possible to determine whether these items would significantly predict PTSD at six months over and above initial PTSD symptomatology, i.e. whether or not these items have a role in the maintenance of PTSD.

The above hypothesis would appear broadly to be supported by the data gathered for this investigation. Further research is necessary, however, to determine

conclusively whether the significant relationship found between peri-traumatic dissociation and PTSD at six months is due to the role of this process in the onset of PTSD, or whether peri-traumatic dissociation has an additional role in the maintenance of PTSD.

9.1.5 Hypothesis 5: The various cognitive processes investigated will be correlated with PTSD symptomatology in Study 1, and in Study 2 will predict chronic PTSD over and above the effects of the variables hypothesised to be involved in the onset of PTSD

The cognitive processes assessed in Study 1 (general thought control strategies, thought control strategies for coping with intrusive memories of the reported frightening event, and post-traumatic appraisals) were found to account for a large proportion of variance in PTSD symptomatology in a sample of non-clinical children and adolescents. In particular the use of thought suppression in coping with intrusive memories of the reported frightening event, endorsing reappraisal as a way of coping with general intrusive thoughts and memories, and the sense of being a feeble person in a scary world were significant associates of PTSD.

The discovery of the role of thought suppression in the aetiology of PTSD emulates the findings of experimental studies in adults that have observed a paradoxical increase in the frequency of to-be-suppressed information (Purdon, 1999), and the discovery of a role for thought suppression in prospective studies of adults exposed to traumatic events (Clohessy & Ehlers, 1999; Ehlers, et al. 1998; Steil & Ehlers, 2000). Such a finding is advocated by Ehlers and Clark's (2000) cognitive model of PTSD in adults, where thought suppression is hypothesised to be not only an avoidant response but, due to the rebound effect, actively worsens the frequency of intrusive memories. This finding of Study 1, contradicts the failure to observe a rebound effect in an experimental study of thought suppression with 11-year-old children (Gaskell, et al. 2001).

The positive correlation between endorsing reappraisal as a way of coping with intrusive thoughts and memories and PTSD symptomatology is at first sight counter-intuitive; reappraisal is often thought of as an adaptive problem-solving

strategy, and in the case of PTSD may serve to rectify maladaptive appraisals, or even assist in the emotional processing of traumatic memories. The data from the present study suggest that in the aftermath of a frightening event, such a coping style is maladaptive. It is likely, therefore, that reappraisal in such circumstances or in this age group is frequently unsuccessful in leading towards resolution of a frightening or traumatic event, and may even be an index of ruminative style; a positive correlation between scores on the RSQ and the reappraisal sub-scale of the cTCQ ($r=.50$, $n=87$, $p<.0001$) suggests that the latter explanation is the case.

Appraising the self as feeble and the world as being a scary place may promote the occurrence of PTSD in a number of ways. Avoidance, and other maladaptive forms of coping, may be encouraged, and hyperarousal on exposure to trauma-related cues may be exaggerated, decreasing the likelihood of habituation over time.

While this evidence strongly implicates a role for cognitive processes in the aetiology of PTSD, it does not differentiate between processes involved in the onset and maintenance of PTSD. Distinguishing onset and maintenance processes was possible in Study 2 however. In addition to the processes examined in Study 1, measures assessing meta-cognitive beliefs and cognitive styles were completed by participants. Ruminative style, fear of anxiety symptoms, endorsement of worry as a positive coping style, and the use of reappraisal in coping with intrusive thoughts and memories, were correlates of PTSD at the initial assessment, and predictors of PTSD at six months post-trauma.

The role of these processes soon after the trauma may have been, in the case of rumination, worry, fear of anxious symptoms, and reappraisal, to exaggerate the importance and meaning of the symptoms of PTSD, the impact of the trauma on their evaluation of their present life and their future prospects, and to maintain a high level of physiological arousal. The finding that a meta-cognitive style where anxious symptoms are negatively appraised was predictive of PTSD suggests that children and adolescents may possess the capacity for the same kind of negative appraisals of post-traumatic symptomatology that have been implicated in adult PTSD (Dunmore, et al. 2001; Ehlers, et al. 1998; Steil & Ehlers, 2000). Worry

may be a factor in maintaining a sense of "current threat", a feature of the model of Ehlers and Clark (2000).

Post-traumatic appraisals, and trauma-specific thought control strategies, both crucial elements of the cognitive model of Ehlers and Clark (2000), were assessed at three months, and were found to be strongly correlated with PTSD at six months. However, only thought suppression was found to account for variance in PTSD scores at six months over and above initial PTSD scores.

In conclusion, this investigation has found that a number of cognitive processes contribute to both the onset and maintenance of PTSD, supporting the hypothesis.

9.1.6 Hypothesis 6: Maladaptive appraisals concerning the trauma or frightening event will be related to the use of maladaptive coping strategies, in both Study 1 and Study 2

Significant relationships between post-traumatic appraisals and maladaptive thought control strategies, were observed in both Study 1 and Study 2. These relationships offer one pathway for how negative post-traumatic appraisals, such as seeing oneself as a weak person or the symptoms of PTSD as being a sign of brain damage or "madness", are associated with more severe PTSD. These data therefore support the hypothesis, and emulate the relationship observed between negative appraisals of intrusive memories and avoidance in adult survivors of RTAs (Steil & Ehlers, 2000).

9.1.7 Hypothesis 7: Family psychopathology and cognitive processes will be found in Study 2 to be related to child PTSD, particularly in the maintenance of the disorder

Parental depression was found to be correlated with child PTSD in families participating in Study 2. Parental endorsement of worry as a positive activity and ruminative style were correlated with initial (two to four week) child PTSD, but not later psychopathology. That parental endorsement of worry impacted on their children's responses to trauma suggests that such attitudes either led to overt

worrisome behaviour (e.g. bringing up the trauma in conversation, expressing concern over future harm) which in turn exaggerated their children's appraisals of future threat, or that such attitudes were modelled by the children prior to the trauma and influenced their cognitive style and responses to the trauma. The quality of parents' memories of the trauma also was correlated with child PTSD, but only at the two to four week assessment point.

While these findings broadly support the hypothesis, many issues regarding the relationship between child and parent responses to trauma remain. The small size of the sample of children and parents who completed self-report questionnaires at each time point precluded the use of regression analyses, which would have been able to identify whether parental responses had any impact over and above child variables alone. This inability to use regression analyses meant that it was not possible to distinguish fully the role of parental variables in the onset and maintenance of child PTSD.

9.1.8 Hypothesis 8: Where prior psychopathology was related to the onset and maintenance of PTSD in participants of Study 2, this relationship will be attributable at least in part to the role of maladaptive cognitive styles and coping strategies that pre-existed the trauma

Psychopathology prior to the assault or RTA was not found to be a significant correlate of PTSD at any time point. This finding contradicts other studies of child and adolescent responses to trauma (Asarnow et al., 1999; La Greca, et al., 1998), though the present study has clear methodological failings relative to these other studies; the assessment of prior psychopathology utilised a crude, dichotomous index of the extent of psychological disorder (i.e. whether or not the child had seen a doctor or other professional regarding an "an emotional or behaviour" problem), and was based solely on a retrospective report obtained from parents.

The lack of a relationship between prior psychopathology and PTSD makes it impossible to evaluate this hypothesis effectively. However, the cognitive processes assessed at the initial time point of Study 2 that were found to have a strong relationship with both the onset and maintenance of PTSD were not

trauma-specific, and may still have been indices of psychopathological processes that existed prior to the trauma. Even if children and adolescents participating in Study 2 had not yet experienced an anxious or depressive disorder, these processes may have been risk factors for experiencing such disorders, which were eventually triggered by the occurrence of the trauma. Only a prospective study where both psychopathology and psychopathological processes were examined prior to the occurrence of a traumatic event would allow a full examination of these issues.

9.1.9 Hypothesis 9: The cognitive processes involved in causing PTSD symptoms in participants of Study 1 and Study 2, in particular negative appraisals, will also play a large role in causing depressive responses to the trauma or frightening event

Memory quality, maladaptive thought control strategies, and post-traumatic appraisals were found to be significantly related to depressive responses in participants of both Study 1 and Study 2. In Study 2, processes involved in the onset and maintenance of depression were again distinguished, with the onset of depression being associated with subjective indices of trauma severity, memory quality, and the cognitive processes measured at the initial assessment point (ruminative style, fear concerning the symptoms of anxiety, endorsing worry, and the use of social support and reappraisal as a way of coping with intrusive thoughts and memories), and the maintenance of depression being associated with a sense of "permanent and disturbing change" and being a "feeble person in a scary world" and trauma-specific thought suppression and rumination.

In both studies the cognitive variables assessed accounted for a considerable proportion of variance in depression scores. While these data support hypothesis 9, the success of these cognitive predictors to account for post-traumatic depression raises the issue of the specificity of the cognitive models of PTSD as applied to children and adolescents. A degree of specificity was observed, with memory quality being more involved in the onset of PTSD, and cognitive styles playing more of a role in the onset of depression. Nevertheless, the power of memory quality to account significantly for both depressive as well as PTSD

symptomatology, despite being considered to be the critical feature underlying the re-experiencing symptoms of PTSD, is problematic. While these disorders may share certain underlying psychopathological processes, future research may be usefully directed towards developing more precise models that distinguish between these processes, as has recently been successfully attempted in adults (Ehring, Glucksman, & Ehlers, 2003).

9.1.10 Summary

The evidence presented in this investigation supports the application of significant elements of cognitive models of PTSD in adults to the understanding of this disorder in children and adolescents. In particular, it has been demonstrated that cognitive processes play a significant role in the aetiology of PTSD over and above objective indices of trauma severity and demographic variables, and that onset and maintenance processes can be differentiated. However, this investigation was not able to examine fully the role of parents in the aetiology of child PTSD, failed to replicate the findings of other studies where prior psychopathology predicts PTSD, and demonstrated that the cognitive processes thought to be playing a major role in the aetiology of PTSD also contributed largely to the aetiology of depressive responses.

9.2 Limitations

The present investigation has contributed to the understanding of cognitive aspects involved in the aetiology of PTSD in children and adolescents. However, several significant methodological and theoretical issues limit the application of the investigation's findings.

Firstly, the age range of participants of both studies was restricted to older children and adolescents. This was considered necessary due to the exploratory nature of the investigation, which is one of the first designed with the aim of applying elements of adult cognitive models of PTSD to children. It is in younger age groups, below the age of 10, where the most significant cognitive development occurs. In this age group the aetiology PTSD may be related less to

higher-order cognitive processes such as rumination, worry, thought suppression and negative appraisals (for which they did not possess adequate cognitive development), but more to other processes such as linguistic development (involved in the encoding of the trauma) and social support.

Secondly, the studies were conducted with regards either to "frightening events" that may not have been "traumatic" (in the case of Study 1), or only to assaults and RTAs (in the case of Study 2). Many of the events reported by participants of Study 1 would probably not be considered to reach Criterion A of DSM-IV, i.e. be recognised as being traumatic. The sample obtained for Study 1 did function as a useful analogue population, with similar cognitive processes being implicated in the aetiology of PTSD as were implicated in participants of Study 2, but such a sample may prove to be less useful for considering in greater detail aspects of the children's cognitive responses to the trauma, such as memory processes. Study 2 relied on the recruitment of children and adolescents who attended an A&E department in South London following either an assault or RTA. These events are in themselves "one-off" events; this feature of the study sample was enhanced by excluding children and adolescents who had been assaulted by parents, where there existed the possibility of serial violence and abuse. There exists the possibility that the cognitive processes examined in this study may play differing roles in the aftermath of other types of trauma, in particular following chronic trauma (e.g. war, abuse).

Thirdly, the numbers of participants recruited for Study 2 and the proportion of participants who completed the follow up assessments was low. Larger numbers of participants and a higher retention rate would have allowed for regression analyses with greater power, particularly when examining the impact of parental psychopathology and cognitive processes, and for examining the relative impact of the individual cognitive processes assessed in children, e.g. appraisal processes assessed at three months. Furthermore, greater numbers of participants would have allowed for comparison of the assault and RTA groups, so as to assess whether the impact of the cognitive processes investigated might be generalised across traumas.

Fourthly, as mentioned at the end of chapter 6, using the RIES-C as the principal self-report measure of PTSD may have not have been warranted. While this measure has been used widely and successfully in research studies of children and adolescents exposed to trauma, the omission of certain key PTSD symptoms (such as nightmares, flashbacks, and emotional numbing) may have made this measure more pertinent to moderate PTSD reactions. This may explain why participants in Study 1 scored relatively highly on this measure, and the ability of the cognitive processes to account for a great deal of variance in RIES-C scores. Had the CPSS, which comprises items that match to each of the DSM-IV symptoms of PTSD, been used in this study, the amount of variance accounted for might have been smaller. Similarly, when examining the role of cognitive and other processes in the onset of PTSD in Study 2, different results may have been obtained with the CPSS.

Fifthly, the measure of memory quality designed for this investigation, the MMQ, is in need of further clarification. This measure was found to account for a substantial proportion of variance in PTSD scores over and above objective and subjective indices of trauma severity. However, the content of this measure (see chapter 4 for a list of the items that were included in this measure) bears a strong resemblance to aspects of the re-experiencing symptoms of the PTSD diagnosis; it might be argued therefore that this measure acts merely as a further index of PTSD, rather than measuring a critical underlying process. While the MMQ only comprises items that refer to the quality of trauma memories, rather than the frequency with which such memories are intrusively experienced, investigation of this measure in conjunction with other, possibly experimental, measures of trauma memory quality (e.g. narrative analysis, examination of trauma memories in comparison with other autobiographical memories) is warranted.

Sixthly, negative post-traumatic appraisals (concerning a sense of permanent and disturbing change, and being a feeble person in a scary world), and maladaptive trauma-specific coping strategies in Study 2 were only assessed at three months post-trauma. Since it was not considered viable to assess these variables at the initial two to four week assessment due to methodological concerns (i.e. not

wishing to overburden participants at this time point), it was not possible to rule out a role for such appraisals and coping strategies in the onset of PTSD.

9.3 Clinical implications

The findings of this investigation have several implications for clinical practice with children and adolescents exposed to trauma. When considering these implications, however, the above limitations must be held in mind.

Firstly, the major role of memory quality observed in both studies of this investigation suggest that tackling this aspect of children and adolescents' responses to a traumatic event is a fundamental component of any psychological treatment for PTSD. Simply challenging maladaptive appraisals and coping strategies would not be expected to modify the quality of an individual's memory of a traumatic event, and hence address a central process underlying PTSD.

Secondly, while changing maladaptive appraisals and coping strategies may not on their own be sufficient for the treatment of PTSD in children and adolescents, the evidence presented here does suggest that it may aid treatment. Ruminative style and negative appraisals, demonstrated here to be involved in maintaining PTSD, may generate the kind of "secondary emotions" which Brewin et al. (1996) consider to be impediments to successful habituation to trauma-related stimuli. Tackling such processes prior to modifying the nature of trauma memories may greatly increase the success of the intervention.

Thirdly, the high rate of PTSD observed in participants who had experienced an assault, and the similarity between participants exposed to assault and participants exposed to RTAs in the level and time course of PTSD symptomatology, suggest that assaults are a neglected cause of PTSD, to which the existing findings regarding children and adolescent's responses to RTAs may be appropriately applied. Larger-scale studies in different socio-economic contexts that examine children and adolescents' responses to assaults are warranted in order to verify these findings, particularly when it is considered that such events are commonly occurring events amongst youth (MORI, 2002). Nevertheless, the need for

medical professionals to be aware of the significant psychological injury caused by one-off, non-sexual assaults is clear.

Fourthly, the ability of the ASD diagnosis and early PTSD symptomatology to predict PTSD at six months, together with the significant drop in PTSD symptomatology between the two to four week and three month time points, suggest that intervention for children and adolescents at three months post-trauma may be appropriate. As unassisted recovery seems to occur for a period of three months or so following a trauma, treating children and adolescents with PTSD before this period has elapsed may be unnecessary. Intervention at the three month point, however, may prevent the formation of chronic and more complicated post-traumatic stress reactions. Further examination of the time course of PTSD symptomatology over the first few weeks and months following a trauma is still required, but the implication of data obtained from Study 2 is that serious cases of enduring PTSD may be identified early on.

Fifthly, the results of both Study 1 and Study 2 suggest that memory quality and intrusive memory frequency plays some role in depressive responses to distressing events (thought did not account for unique variance in depressive symtpomatology). This aspect of depression in children and adolescents has received little attention, despite findings from investigations conducted in adult populations suggesting that intrusive memories may be a common feature of depression (Reynolds & Brewin, 1998; 1999). Acknowledging the occurrence of intrusive memories and providing appropriate strategies for coping with such phenomena may be an additional tool for clinicians working with depressed youth.

9.4 Future research

The limitations of this investigation, outlined in sub-section 9.2, present several ways in which the understanding of PTSD in children and adolescents might be advanced, e.g. examining cognitive processes in larger samples, investigating a younger age range, using more appropriate measures. Future research also might be addressed towards other issues arising from the application of adult cognitive

models of PTSD to children and adolescents. Three examples of questions such research might address are given here.

Firstly, what processes are involved in the formation of sensory based, fragmented, affect laden and poorly verbalised memories, the kinds of memories that are hypothesised to be responsible for the onset of PTSD, has yet to be investigated in children and adolescents exposed to trauma. While the dissociation criterion of ASD did not add significantly to the ability of this diagnosis to predict chronic PTSD, dissociative processes may have prevented thorough processing of the trauma as it occurred or in its aftermath. Low intelligence, in particular low verbal intelligence, may have limited the extent to which the formation of verbal memories of a trauma was possible. Peri-traumatic panic also may have interfered with the processing of a trauma as it occurred. Study 2, the prospective study, found that while processes involved in the maintenance of PTSD play a significant role, most variance in PTSD at six months was explained by initial PTSD levels. It is therefore imperative that processes potentially involved in the onset of PTSD receive further investigation.

Secondly, in the case of cognitive processes involved in both the onset and maintenance of PTSD there is a need to examine whether such processes pre-existed the trauma. There is the possibility that individuals with PTSD exaggerated their responses to measures assessing cognitive processes, treating them as indices of general distress, with the result that a significant relationship between these processes and PTSD scores was found. While such processes, such as rumination, may have been playing some role, their impact may have been overstated. In order to rule out this explanation, it would be necessary to examine such processes prior to the trauma. This is particularly true when attempting to identify whether processes such as trait dissociation and intelligence are involved in the onset of PTSD. A study similar to Study 1, with a prospective rather than a cross-sectional design, might be used to examine what consider more thoroughly what processes were involved in the onset and maintenance of PTSD. Cognitive processes such as anxiety sensitivity, ruminative and worrisome styles, and trait dissociation, would be assessed at the first time point, and then at a second time point post-traumatic stress reactions to any recently occurring traumatic events

would be assessed. Such a study would allow for regression analyses to elucidate the role of the processes assessed without concern that participants' endorsements of such processes were influenced by their PTSD symptomatology. How prior psychopathology impacted on post-traumatic stress responses to trauma, if such a relationship existed, might also be expounded using this methodology.

Thirdly, further work is necessary to examine if children and adolescents modify memories of a traumatic event without professional assistance, and if they do, what techniques they use to achieve this. Little research has examined in depth how children and adolescents exposed to trauma make use of the social support of family and friends, utilise media such as diaries and writing, or practice forms of in vivo or imaginal exposure in handling their memories of the event. Identifying successful ways of addressing the kinds of memories that are central to the aetiology of PTSD, that are also acceptable to at least some children and adolescents, may inform how behavioural elements of psychological treatments for youth with PTSD are conducted.

9.5 Conclusion

Cognitive aspects of PTSD in children and adolescents were examined in two studies, one using a cross-sectional design and the other a prospective design. In particular the applicability of elements of cognitive models of PTSD in adults (Brewin et al., 1996; Ehlers & Clark, 2000) to children and adolescents was investigated. Each study found that cognitive processes, including memory quality, subjective indices of trauma severity, rumination, maladaptive thought control strategies, and maladaptive trauma-related appraisals, were related to PTSD symptomatology. The second of the two studies conducted, a prospective study of children and adolescents exposed to assaults and RTAs, yielded data supporting a distinction between processes involved in the onset and maintenance of PTSD.

Therefore, the application of key features of adult cognitive models of PTSD to children aged over 10 years was supported. More than this, however, the data

presented here have wider implications for both child and adolescent and adult cognitive models of PTSD.

Firstly, the evidence presented here is relevant to the assessment of the adult cognitive models of PTSD from which the hypotheses tested in this investigation were derived (Brewin et al., 1996; Ehlers & Clark, 2000). While the present investigation supported the onset-maintenance distinction that is a central feature of each of these models, it was also observed that onset processes played the most significant role. An ASD diagnosis and early ASD/PTSD criteria were good predictors of later PTSD, while two to four week PTSD symptomatology accounted for a very large proportion of variance in PTSD symptomatology at six months. The processes proposed by Brewin et al. (1996) and Ehlers and Clark (2000) to be responsible for the maintenance of PTSD (e.g. shame and anger, negative post-traumatic appraisals, rumination) may still have a significant role, but their importance must be considered to be secondary to processes involved in the onset of PTSD. This is further supported by the failure of nearly all three month cognitive processes to account for variance in PTSD at six months over and above initial PTSD symptomatology. The ability of early post-traumatic stress to predict later PTSD is recognised in adults (Brewin et al., 1999; Harvey & Bryant, 1998), yet many studies have failed to acknowledge this fact, and have focused on examining psychological processes that predict later PTSD. Thus, it is suggested that attempts to uncover why certain individual children or adults develop *acute* post-traumatic stress would shed the most light on this disturbing condition.

Of the onset processes proposed by both Brewin et al. (1996) and Ehlers and Clark (2000), the variable found to be the most significant in the present investigation was memory quality. Both of these models suggest that the nature of trauma memories is central to the aetiology of PTSD, and this is supported by the present study. The major role for memory quality in the onset of PTSD, and the failure of this variable to account for any unique variance in depressive symptomatology, emphasises that PTSD, while categorised within DSM-IV (American Psychiatric Association, 1994) as an anxiety disorder, is best understood as being a memory disorder. While anxiety refers to a more vague apprehension about future harm, the strong involvement of the nature of trauma

memories in PTSD suggests that it is the recall of particular types of trauma memory that gives rise to the core symptoms of PTSD. An advantage of the Brewin et al. (1996) model over the Ehlers and Clark (2000) model in this regard is that Brewin and colleagues relate the time course of PTSD (and particularly why some individuals recover and others do not) specifically to the nature of trauma memories, and the degree of processing that such memories receive.

Both the Brewin et al. (1996) and the Ehlers and Clark (2000) models emphasise the importance of the quality of trauma memory, but also build upon the fear conditioning component of previous models, such as Foa et al. (1989). While memory quality was perhaps the single most important factor to be associated with PTSD in this investigation, Study 2 also found that subjective trauma severity items accounted for unique variance in the onset of PTSD, i.e. extreme fear may on its own cause some post-traumatic stress symptomatology. Thus, it is important not to disregard the fear conditioning component of the adult models of PTSD. Indeed, fear conditioning offers a better explanation of certain re-experiencing symptoms, e.g. the DSM-IV symptom of "Physiological reactivity upon exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event", as well as various hyperarousal symptoms. The distinction between different forms of memory processes that elicit PTSD suggests that there are multiple pathways to the onset of PTSD that adult (and child) models of the disorder might need to account for.

A second wider implication concerns the issue of whether PTSD in children and adolescents is fundamentally different to PTSD in adults. This investigation has replicated the similarities observed between adult and child PTSD that were presented in the Introduction (see particularly sub-sections 1.4 and 1.5): children and adolescents assessed in this investigation reported the full range of PTSD symptomatology, and experienced a decrease in PTSD symptomatology, as has been observed in studies of adult populations exposed to trauma such as assaults and RTAs.

The one difference between children and adolescents in this study and adult populations was the failure of social support to help protect against PTSD

symptomatology (cf. Joseph et al., 1994). This does not suggest that there is a significant underlying difference in the nature of PTSD between these age groups; social support is a process involved in a wide range of psychopathology, and cannot be considered to be particularly pertinent to the aetiology of adult PTSD. Since the only differences between child and adult PTSD relate to the range of psychosocial factors that impact on individuals experiencing this disorder, it is reasonable to assume that PTSD is essentially the same disorder in both these age groups.

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Appendix A: Materials used in Study 1

- Letter for Parents – opt-in version

- Letter for Parents – opt-out version

- Information sheet given to children and adolescents

- Consent form for children and adolescents participating in Study 1

- Questionnaire Battery

Letter for Parents – opt-in version

Dear Parent,

How children and young people feel after a frightening event and what their memories of the event are like

We are a group of researchers from King's College London and would like your child to take part in our study. This study is looking at how children think and feel after they have been involved in a frightening event. In addition we are hoping to understand more about children's memories of frightening events.

We are hoping to ask children at your child's school about the most frightening event that has happened to them in the last two months. This will involve your child telling us what was the most frightening event to have happened to him or her in the past two months, and filling in some questionnaires about memories of the event and how he or she has been feeling since it happened. Your child will also be asked to fill in some questionnaires about how he or she feels now.

Your child does not have to take part. It is entirely up to you and your child whether he or she takes part. If you do not mind your child taking part in the study, *then please complete the slip below and return it to your child's teacher*. If you do not return the slip within the next two weeks, we will assume that you *do not* give your permission for your child to participate.

If you do not allow your child to take part, or if you later change your mind and decide to withdraw your child from the study, then you are free to do so and we will not ask why. If you decide not to take part in the study, or if you later on withdraw your child from the study, this will *not* affect how you or your child are treated.

Any information that your child tells us will be kept secret and only used by other researchers within our group, *unless* your child is thought to be in any danger. If you have any questions or would like some more information, please call Richard Meiser-Stedman on 020 7848 0766.

Yours sincerely,

Richard Meiser-Stedman
Dr Patrick Smith
Prof. William Yule

I *do / do not* [please delete as applicable] give permission for my child to take part in the "How children feel after upsetting events" study.

Child's name: _____

Parent or guardian's name: _____

Parent's signature: _____ Date: _____

Letter for Parents – opt-out version

Dear Parent,

How children and young people feel after a frightening event and what their memories of the event are like

We are a group of researchers from King's College London. We would like to invite your child to take part in our study looking at how children think and feel after they have been involved in a frightening event. The information we are gathering will help those working with children who have been particularly distressed following frightening events.

We are hoping to ask pupils at your child's school about the most frightening event that has happened to them in the last two months. This will involve your child telling us what was the most frightening event to have happened to him or her in the past two months, and filling in some questionnaires about their memories of the event and how he or she has been feeling since it happened. [Head teacher's name] has given us permission to conduct this study at [School name].

This study is voluntary; it is up to you and your child whether he or she takes part. Your child will be given an information sheet about the study at school, telling them this. In order to make it easier for children to participate in the study, we are writing to each child's parent to inform them about this study. ***If you would <u>not</u> like your child to participate in the study, then please would you return the slip below indicating your wishes by the*** ..... If you are happy for your child to participate in this study, then you do not have to return the slip; ***if we do not hear from you we will assume that you are happy for your child to participate.***

If you do not allow your child to take part, or if you later change your mind and decide to withdraw your child from the study, then you are free to do so and we will not ask why. If you decide not to take part in the study, or if you later on withdraw your child from the study, this will *not* affect how you or your child are treated. Any information that your child tells us will be kept secret and only used by other researchers within our group, *unless* your child is thought to be in any danger. If you have any questions or would like some more information, please call Richard Meiser-Stedman on 020 7848 0580. Thank you for your time.

Yours sincerely,

Richard Meiser-Stedman
Dr Patrick Smith
Prof. William Yule

I *do / do not* [please delete as applicable] give permission for my child to take part in the "How children feel after upsetting events" study.

Child's name: _____ Class: _____

Parent or guardian's name: _____

Parent's signature: _____ Date: _____

Information Sheet for Children and Young People

How children and young people feel after a frightening event and what their memories of the event are like

We would like you to take part in our study. Our study is looking at how children think and feel after they have been involved in an upsetting or frightening event, and what their memories of the event are like.

We would like you to tell us what was the most upsetting or frightening event that has happened to you in the last two months, and fill in some questionnaires about your memories of the upsetting or frightening event, and how you have been feeling since it happened. We would also like you to fill in some questionnaires about how you feel now.

You do not have to take part. It is entirely up to you whether you take part or not. If you do want to take part, you can change your mind later and we will not ask you why. If you do not want to take part, we will not ask you why.

If you decide not to take part in the study, this will not affect how you are treated by your school or King's College London. If you decide to take part in the study at first, and then later on decide that you do not want to take part anymore, this also will not affect how you are treated.

Any information that you tell us will be kept secret, *unless* you are in any danger.

If you have any questions or would like some more information, please call Richard Meiser-Stedman on 020 7848 0766, or Dr Patrick Smith on 020 7848 0506.

Consent form

How children and young people feel after a frightening event and what their memories of the event are like

I agree that the purpose of this study has been explained to me, that I have received an information sheet, and that I have had a chance to ask questions about the study. I understand what is involved for me if I agree to take part in the study.

I understand that I am taking part in this study because I want to. I understand that I can withdraw from the project at any time, and that I don't have to give a reason why. I also understand that if I don't take part in the study or stop taking part at any time, I won't be treated any differently by my school or King's College London.

I understand that any information I tell will be kept secret, *unless* I am in any danger.

Name of child or young person: _____

Signature of child or young person: _____ Date: _____

Name of investigator: (Present at giving of information and signature) _____

Signature of investigator: _____ Date: _____

Questionnaire Booklet

Young people's memories of frightening events

Thank you for agreeing to take part in this study.

Please complete this page before filling in the rest of the booklet. If you have any questions about how to complete this booklet, then please ask your teacher.
Remember: you can decide at any time not to take part in this study, and you don't have to give a reason why. If you decide not to take part, you will not be treated any differently.

Also remember: All the information you give us will not told to anyone else, unless you are in danger.

Today's date:

First Name(s):
Surname:
Date of birth:
Male/Female:
Class:
School:

Section 1 – What was the most frightening event that has happened to you in the past two months?

We would like to know what was the most frightening event that has happened to you in the past two months. Could you write below what happened? You don't have to write very much, a sentence is enough.

_____

_____

_____

_____

_____

_____

Section 2 - How you felt when the frightening event happened

We would like to know how you felt when the frightening event happened. Listed below are some feelings that you might have had. We'd like you to tell us how much you felt each one by ringing a number next to the feeling; the bigger the number more you felt.
There are no right or wrong answers; we are interested in what you think.

SCARED:	NOT SCARED AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY SCARED
ANGRY:	NOT ANGRY AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY ANGRY
SAD:	NOT SAD AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY SAD
ASHAMED:	NOT ASHAMED AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY ASHAMED
HELPLESS:	NOT HELPLESS AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY HELPLESS

Section 3 - How often do you have memories of what happened

When people have frightening events happen to them, they sometimes find that they have memories of what happened pop in to their minds. People might not want these memories to suddenly come back to mind. We would like to know HOW OFTEN you think memories about the frightening event pop into your mind. Please tick the box below that applies to you.

Not at all or only one time	Once a week or less/once in a while	2 to 4 times a week/half the time	5 or more times a week/almost always
[ ]	[ ]	[ ]	[ ]

Section 4 - What you feel like when these memories pop into your mind

We would like to know how you feel whenever memories of the frightening event pop into your mind. Below are some feelings that you might have when memories of the frightening event pop into your mind.
We'd like you to tell us how much you feel each one by ringing a number next to the feeling.

SCARED:	NOT SCARED AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY SCARED
ANGRY:	NOT ANGRY AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY ANGRY
SAD:	NOT SAD AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY SAD
CRAZY:	NOT CRAZY AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY CRAZY
CONFUSED:	NOT CONFUSED AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMEY CONFUSED
ASHAMED:	NOT ASHAMED AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY ASHAMED
HELPLESS:	NOT HELPLESS AT ALL	1	2	3	4	5	6	7	8	9	10 EXTREMELY HELPLESS

Section 5 – What your memories of the frightening event are like

This is a questionnaire all about your memories of the frightening event. We would like to know what your memories feel and seem like. Please read each sentence and tell us how much you agree with each one. Please tick the box that applies.

		Don't agree at all	Don't agree a bit	Agree a bit	Com-pletely agree
1.	My memories of the frightening event are mostly pictures or images.	[ ]	[ ]	[ ]	[ ]
2.	When I think about the frightening event it is just like thinking about anything else that has happened to me.	[ ]	[ ]	[ ]	[ ]
3.	I can't seem to put the frightening event into words.	[ ]	[ ]	[ ]	[ ]
4.	When I have memories of what happened I sometimes hear things in my head that I heard during the frightening event.	[ ]	[ ]	[ ]	[ ]
5.	When I remember the frightening event I feel like it is happening right now.	[ ]	[ ]	[ ]	[ ]
6.	I can sometimes smell things that I smelt when the frightening event happened, even though the smell isn't actually around anymore.	[ ]	[ ]	[ ]	[ ]
7.	I can talk about what happened very easily.	[ ]	[ ]	[ ]	[ ]
8.	I remember the frightening event as a few moments, and each moment is a picture in my mind.	[ ]	[ ]	[ ]	[ ]
9.	My memories of the frightening event are like a film that plays over and over.	[ ]	[ ]	[ ]	[ ]
10.	My memories of the frightening event are very clear and detailed.	[ ]	[ ]	[ ]	[ ]
11.	Remembering what happened during the frightening event is just like looking at photographs of it.	[ ]	[ ]	[ ]	[ ]
12.	When I talk about the frightening event it is just like a reading out a story from a book.	[ ]	[ ]	[ ]	[ ]
13.	When memories come to mind of what happened, I feel my body is in the same position as when the frightening event occurred.	[ ]	[ ]	[ ]	[ ]
14.	My memories of the frightening event feel like memories of other things that have happened to me that aren't very scary.	[ ]	[ ]	[ ]	[ ]

Section 6 - How hard is it to get rid of the memories

We would like to know how easy or difficult it is for you to get rid of memories of the frightening event that pop into your mind.
The harder it is for you get rid of these memories, then the higher the number you ring. If you don't have any memories pop into your mind, then you don't have to answer this question. Remember, there are no right or wrong answers.

EXTREMELY EASY	1	2	3	4	5	6	7	8	9	10	EXTREMELY HARD

Section 7 – What you do to get rid of the memories

We would like to know what you do to get rid of the memories of the frightening event that pop into your mind. Sometimes people try to push these thoughts and memories out of their minds. Sometimes people will try to think about something else instead. We would like to know how much you try to do these things.
Read the sentences below carefully and tick the box that says how much you agree or do not agree with it.

	I don't agree at all.	I don't agree a bit.	I agree a bit.	I agree completely.
1. When I have thoughts or memories about what happened, I try hard to push them out of my mind.	[ ]	[ ]	[ ]	[ ]
2. When I have thoughts or memories about what happened, I try hard to think about something else.	[ ]	[ ]	[ ]	[ ]

Section 8 - What you do when you have any unpleasant thoughts and memories

Most people have unpleasant and unwanted thoughts and memories, which can be difficult to control. These thoughts and memories can be like pictures or spoken words. We are interested in the things that you generally do to control these kinds of thoughts and memories.

Below are a number of things that people do to control these unpleasant thoughts and memories. Please read each statement carefully, and tick the box that indicates how often you do each one. There are no right or wrong answers. Do not spend too much time thinking about each one.

When I have an unpleasant or unwanted thought or memory:

	Never	Some-times	Often	Almost always
1. I try to think clearly about the thought or memory.	[ ]	[ ]	[ ]	[ ]
2. I ask my friends if they have thoughts or memories like mine.	[ ]	[ ]	[ ]	[ ]
3. I concentrate on the thought or memory.	[ ]	[ ]	[ ]	[ ]
4. I do something that I enjoy.	[ ]	[ ]	[ ]	[ ]
5. I don't talk about the thought or memory to anyone.	[ ]	[ ]	[ ]	[ ]
6. I find out how my friends deal with these thoughts or memories.	[ ]	[ ]	[ ]	[ ]
7. I get angry with myself for having the thought or memory.	[ ]	[ ]	[ ]	[ ]
8. I keep myself busy.	[ ]	[ ]	[ ]	[ ]
9. I keep the memory to myself.	[ ]	[ ]	[ ]	[ ]
10. I punish myself for thinking the thought or memory.	[ ]	[ ]	[ ]	[ ]
11. I remember good times.	[ ]	[ ]	[ ]	[ ]
12. I replace the thought or memory with another bad thought or memory that isn't very important.	[ ]	[ ]	[ ]	[ ]
13. I shout at myself for having the thought or memory.	[ ]	[ ]	[ ]	[ ]
14. I slap or pinch myself to stop the thought or memory.	[ ]	[ ]	[ ]	[ ]

Continued over the page...

	Never	Some-times	Often	Almost always
15. I talk to a friend about the thought or memory.	[ ]	[ ]	[ ]	[ ]
16. I tell myself not to be so stupid.	[ ]	[ ]	[ ]	[ ]
17. I tell myself that something bad will happen if I have the thought or memory.	[ ]	[ ]	[ ]	[ ]
18. I think about nice things.	[ ]	[ ]	[ ]	[ ]
19. I think about other things that are bothering me.	[ ]	[ ]	[ ]	[ ]
20. I think about problems that aren't so important.	[ ]	[ ]	[ ]	[ ]
21. I think about something else which upsets me.	[ ]	[ ]	[ ]	[ ]
22. I think about something else.	[ ]	[ ]	[ ]	[ ]
23. I think about things that used to bother me.	[ ]	[ ]	[ ]	[ ]
24. I try a different way of thinking about it.	[ ]	[ ]	[ ]	[ ]
25. I try and do something around the house.	[ ]	[ ]	[ ]	[ ]
26. I try not to talk about the thought or memory.	[ ]	[ ]	[ ]	[ ]
27. I try to come up with a better thought or memory.	[ ]	[ ]	[ ]	[ ]
28. I try to see if the thought or memory is really true.	[ ]	[ ]	[ ]	[ ]
29. I wonder why I am having the thought or memory.	[ ]	[ ]	[ ]	[ ]
30. I worry about more minor things instead.	[ ]	[ ]	[ ]	[ ]

Section 9 - How I've been feeling about the frightening event

This is a questionnaire about how you've been feeling since the frightening event happened. Below are some comments other people have made about frightening events. Please read each one and tick the box that shows how often each comment is true for you *DURING THE PAST SEVEN DAYS*. If none of them are true, then tick the "not at all" box.

During the last seven days...		Not At All	Rarely	Some-times	Often
1.	Do you think about it even when you don't mean to?	[ ]	[ ]	[ ]	[ ]
2.	Do you try to remove it from your memory?	[ ]	[ ]	[ ]	[ ]
3.	Do you have difficulties paying attention or concentrating?	[ ]	[ ]	[ ]	[ ]
4.	Do you have waves of strong feeling about it?	[ ]	[ ]	[ ]	[ ]
5.	Do you startle more easily or feel more nervous than you did before it happened?	[ ]	[ ]	[ ]	[ ]
6.	Do you stay away from reminders of it (e.g. places or situations)?	[ ]	[ ]	[ ]	[ ]
7.	Do you try not to talk about it?	[ ]	[ ]	[ ]	[ ]
8.	Do pictures about it pop into your mind?	[ ]	[ ]	[ ]	[ ]
9.	Do other things keep making you think about it?	[ ]	[ ]	[ ]	[ ]
10.	Do you try not to think about it?	[ ]	[ ]	[ ]	[ ]
11.	Do you get easily irritable?	[ ]	[ ]	[ ]	[ ]
12.	Are you alert and watchful even when there is no obvious need to be?	[ ]	[ ]	[ ]	[ ]
13.	Do you have sleep problems?	[ ]	[ ]	[ ]	[ ]

Section 10 - How I have been feeling lately

This questionnaire is all about how you've been feeling generally in the past week. There are no right answers but it is important to say how you have felt. Please answer as honestly as you can. Put a tick in the appropriate box.

	MOST	SOME-TIMES	NEVER
1. I look forward to things as much as I used to.	[ ]	[ ]	[ ]
2. I sleep very well.	[ ]	[ ]	[ ]
3. I feel like crying.	[ ]	[ ]	[ ]
4. I like to go out to play.	[ ]	[ ]	[ ]
5. I feel like running away.	[ ]	[ ]	[ ]
6. I get tummy aches.	[ ]	[ ]	[ ]
7. I have lots of energy.	[ ]	[ ]	[ ]
8. I enjoy my food.	[ ]	[ ]	[ ]
9. I can stick up for myself.	[ ]	[ ]	[ ]
10. I think life isn't worth living.	[ ]	[ ]	[ ]
11. I am good at things I do.	[ ]	[ ]	[ ]
12. I enjoy the things I do as much as I used to.	[ ]	[ ]	[ ]
13. I like talking with my family.	[ ]	[ ]	[ ]
14. I have horrible dreams.	[ ]	[ ]	[ ]
15. I feel very lonely.	[ ]	[ ]	[ ]
16. I am easily cheered up.	[ ]	[ ]	[ ]
17. I feel so sad I can hardly stand it.	[ ]	[ ]	[ ]
18. I feel very bored.	[ ]	[ ]	[ ]

Section 11 - How I have been thinking lately

This questionnaire is about the kinds of things that you have been thinking since the frightening event. Please read the sentences below and tick the box that says how much you agree or disagree with each one. Remember that there are no right or wrong answers.

		Don't agree at all	Don't agree a bit	Agree a bit	Agree a lot
1.	Anger will make me lose control.	[ ]	[ ]	[ ]	[ ]
2.	Anyone could hurt me.	[ ]	[ ]	[ ]	[ ]
3.	Bad things always happen.	[ ]	[ ]	[ ]	[ ]
4.	Everyone lets me down.	[ ]	[ ]	[ ]	[ ]
5.	I am a coward.	[ ]	[ ]	[ ]	[ ]
6.	I am always going to cause frightening events.	[ ]	[ ]	[ ]	[ ]
7.	I am different to other kids because of what happened to me.	[ ]	[ ]	[ ]	[ ]
8.	I am no good.	[ ]	[ ]	[ ]	[ ]
9.	I can't cope when things get tough.	[ ]	[ ]	[ ]	[ ]
10.	I can't stop bad things from happening to me.	[ ]	[ ]	[ ]	[ ]
11.	I don't have any feelings.	[ ]	[ ]	[ ]	[ ]
12.	I don't think I'm coping as well as I should.	[ ]	[ ]	[ ]	[ ]
13.	I don't trust people.	[ ]	[ ]	[ ]	[ ]
14.	I feel like a robot sometimes.	[ ]	[ ]	[ ]	[ ]
15.	I feel like I am a different person since the frightening event.	[ ]	[ ]	[ ]	[ ]
16.	I had a feeling the frightening event was going to happen.	[ ]	[ ]	[ ]	[ ]
17.	I have no future.	[ ]	[ ]	[ ]	[ ]
18.	I have to be really careful because something bad could happen.	[ ]	[ ]	[ ]	[ ]
19.	I have to watch out for danger all the time.	[ ]	[ ]	[ ]	[ ]
20.	I helped make the frightening event happen.	[ ]	[ ]	[ ]	[ ]
21.	I knew that the frightening event would happen.	[ ]	[ ]	[ ]	[ ]

Continued on next page...

	Don't agree at all	Don't agree a bit	Agree a bit	Agree a lot
22. I must control my thoughts and feelings about the frightening event or I will go crazy.	[ ]	[ ]	[ ]	[ ]
23. I used to be a happy person but now I am always sad.	[ ]	[ ]	[ ]	[ ]
24. I will always be angry with the people who caused the frightening event.	[ ]	[ ]	[ ]	[ ]
25. I will never be able to have normal feelings again.	[ ]	[ ]	[ ]	[ ]
26. I'm scared that I'll get so angry that I'll break something or hurt someone.	[ ]	[ ]	[ ]	[ ]
27. I'm the kind of person who always gets into trouble.	[ ]	[ ]	[ ]	[ ]
28. If I avoid things after the frightening event it means I am a coward.	[ ]	[ ]	[ ]	[ ]
29. If I let out my feelings bad things will happen.	[ ]	[ ]	[ ]	[ ]
30. If I was a better person, I could have stopped the frightening event from happening.	[ ]	[ ]	[ ]	[ ]
31. Life is not fair.	[ ]	[ ]	[ ]	[ ]
32. My friends at school wouldn't have got involved in frightening events.	[ ]	[ ]	[ ]	[ ]
33. My life has been destroyed by the frightening event.	[ ]	[ ]	[ ]	[ ]
34. My reactions since the frightening event mean I have changed for the worse.	[ ]	[ ]	[ ]	[ ]
35. My reactions since the frightening event mean I will never get over it.	[ ]	[ ]	[ ]	[ ]
36. My reactions since the frightening event mean something is seriously wrong with me.	[ ]	[ ]	[ ]	[ ]
37. My reactions since the frightening event show that I must be going crazy.	[ ]	[ ]	[ ]	[ ]
38. No one understands me anymore.	[ ]	[ ]	[ ]	[ ]
39. Not being able to get over all my fears means that I am a failure.	[ ]	[ ]	[ ]	[ ]
40. Nothing good can happen to me anymore.	[ ]	[ ]	[ ]	[ ]
41. Small things upset me.	[ ]	[ ]	[ ]	[ ]

Continued over the page...

		Don't agree at all	Don't agree a bit	Agree a bit	Agree a lot
42.	Someone should be punished for what happened to me.	[ ]	[ ]	[ ]	[ ]
43.	Something terrible will happen if I do not try to control my thoughts about the frightening event.	[ ]	[ ]	[ ]	[ ]
44.	The frightening event happened as a punishment for me.	[ ]	[ ]	[ ]	[ ]
45.	The frightening event has changed me forever.	[ ]	[ ]	[ ]	[ ]
46.	The world is a dangerous place.	[ ]	[ ]	[ ]	[ ]
47.	What happened to me is really unfair.	[ ]	[ ]	[ ]	[ ]

This is the end of the questionnaire – thanks for filling it in!

Please now go through the booklet and check that you've answered all the questions on each page.

Appendix B - Materials used in Study 2

- Invitation letter
- Information sheet for children and adolescents
- Information sheet for parents
- Consent form
- Consent form for tape recording interview
- Child self-report questionnaires at initial (two to four week) assessment
- Parent self-report questionnaires at initial (two to four week) assessment
- Child self-report questionnaires at three month follow up assessment
- Parent self-report questionnaires at three month follow up assessment

Invitation letter

Date

Accident and Emergency Department
Tel: 020 7346 3938 (10am-10pm)

Dear [Parent's name],

How children and young people feel after being in a frightening event

We are carrying out a study with colleagues at the Institute of Psychiatry looking at the ways in which children and young people react when they have been involved in a frightening event, such as a road traffic accident, or being mugged.

We would like to invite you and [Child's name] to participate in our study. My colleagues have included information sheets for you both that outline what participating in this study would involve.

I would like to stress that your participation in this study would be entirely voluntary. If you decide not to take part, it would not affect your future treatment from the Accident and Emergency department or at the Institute of Psychiatry. Likewise, if you decide to participate in the study you can always withdraw from the study at any time, without giving a reason, and without affecting the treatment you receive from Accident and Emergency or the Institute of Psychiatry.

The Institute of Psychiatry is a leading world centre for the study and treatment of children's reactions to frightening events. If your child is suffering badly as a result of what the frightening event they were involved in, the clinical psychologists there can ensure that they get the best possible treatment. They will discuss this with you in further depth, should the need arise.

Richard Meiser-Stedman, a researcher at the Institute of Psychiatry, will be in touch with you within the next few days to see how you would feel about participating, and answer any questions you might have. If you are willing to take part in the study, Richard will be able arrange a time when you might come and meet us, or if it is not convenient for you to come back to King's College, when he might come and meet you at your home.

Thank you for considering this request.

Yours sincerely,

Dr Ed Glucksman

Richard Meiser-Stedman,
Dr Patrick Smith, & Professor William Yule

Department of Psychology, Institute of Psychiatry
Kings College London, De Crespigny Park
London SE5 8AF, Tel. 020 7848 0766

Information Sheet for Children and Young People

How children think and feel after being in a frightening event

We would like to invite you to take part in our study. Our study is looking at how children and young people think and feel after they have been involved in a frightening event.

We would like to talk to you and one of your parents about the frightening event, and about how you have been thinking and feeling since it happened. We would also like you to fill in some questionnaires about how you feel.

We would like to meet you 2 times, so that we can see how you are getting on. We would like to meet you for the first time in the next 2-4 weeks, and the second time in about 6 months time. Each time we meet you will take about 1½ hours to have a talk and to do the questionnaires. We would also like to send you some questionnaires in about 3 months time which you can fill in and send back to us.

Everyone between 10 and 16 years of age who comes to the King's College Hospital A&E department is going to be invited to take part in our study, and we hope to have around 140 children and young people taking part.

You do not have to take part. It is entirely up to you whether you take part or not. If you do want to take part, you can change your mind later and we will not ask you why. If you do not want to take part, we will not ask you why.

If you decide not to take part in the study, this will not affect your care at any hospitals. If you decide to take part in the study at first, and then later on decide that you do not want to take part anymore, this also will not affect your care here.

Anything that you tell us will be completely confidential; only people who work in our group will be able to look at what you've said.

Thank you for thinking about taking part in our study.

If you have any questions or would like some more information, please call Richard Meiser-Stedman on 020 7848 0580, or Dr Patrick Smith on 020 7848 0506.

Information Sheet for Parents

How children think and feel after being in a frightening event

We would like to invite you and your child to participate in our study. Please read this carefully if you wish for you and your child to participate. Your participation is entirely voluntary.

Purpose of the study

We are conducting a research study looking at what causes children to develop long-term reactions to frightening events. Your child's participation in the study will help us to better identify which children are at risk of developing severe reactions to frightening events, and how we can help these children to get over what has happened to them.

What will the study involve

You and your child will be asked to meet with us for an interview and to fill in some questionnaires at two points; within a month after the frightening event, and about six months after the event. We would like to talk to you and your child about the frightening event, and any problems your child might have had since it happened. The questionnaires will require you and your child to respond with your impressions of the event itself, your thoughts and feelings since the event, how your family has been coping since the event, and how you cope with various aspects of the frightening event. Each meeting will take about 1½ to 2 hours with you and your child. At about three months after the frightening event we would also like to send some questionnaires to you for your child and yourself to complete.

We are inviting all children and young people aged between 10 and 16 who are admitted to King's College Hospital to take part in our study, and we hope to have 140 children take part. The results we obtain may be published in order to help other people working with children who have been in frightening events, *but you or your child would not be named.*

If at the end of the study we think that your child might be suffering from any serious problems, we can discuss with you and your GP getting appropriate help for your child. This professional help might come from the Institute of Psychiatry or Maudsley hospital. The Institute of Psychiatry and the Maudsley hospital are one of the leading centres internationally for the assessment and treatment of child who have been exposed to very frightening events, such as road traffic accidents and other man-made disasters.

Participation and withdrawal

All the information recorded will be strictly confidential, and used only by clinicians and researchers working within the child traumatic stress clinic at the Institute of Psychiatry. Information about you and your child will be stored anonymously. If you decide to take part, you can withdraw *at any time* and *without giving a reason.*

If you decide not to take part or decide to withdraw from the study, this will not affect the care you receive at any hospitals.

You will receive a copy of this information sheet and the signed consent form if you decide to participate.

Thank you for considering taking part in our study.

For more information
Please ask if there is anything you or your child does not understand or if you would like more information. You can contact Richard Meiser-Stedman on 020 7848 0580, or Dr Patrick Smith on 020 7848 0506.

Consent form

An investigation into psychological reactions in children involved in frightening events

I confirm that the purpose of this study has been explained to me and that I have had a chance to ask questions about the study. I understand what is involved for my child and myself if we volunteer. I understand that I will receive a copy of this signed consent form and the information sheets, and that copies of these also will be kept by the investigator.

I understand that participation is entirely voluntary and that I can withdraw from the project at any time, without giving a reason for doing so, and without affecting any future care. The data collected will be confidential.

Name of child _____

Signature of child _____ Date _____

Name of principal caregiver _____

Signature of principal caregiver _____ Date _____

Name of investigator (present at giving of information and signature) _____

Signature of investigator _____ Date _____

Consent form for recording of interview

One copy to be kept with Film. **One copy with Patient's Case Notes.**

INSTITUTE OF PSYCHIATRY/SOUTH LONDON AND MAUDSLEY NHS TRUST

Consent Form - Recorded Interviews

I consent to the recording of an interview with me/my relative being made and kept on videotape/audiotape.

I understand that this recording may be used for purposes of assessment, teaching or research. Strict confidentiality will always be observed, and it will be seen only within the Institute of Psychiatry and South London and Maudsley NHS Trust by professional staff or their trainees.

I understand that I will be further consulted before this recording is shown to a wider audience. (Any permission for wider showing to be noted here and separately signed and dated).

NAMES OF ALL TIIOSE APPEARING ON TIIE RECORDING	**AGE (if under 18)**	**SIGNATURES**
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

NAME OF PARENT OR RELATIVE SIGNING ON BEIIALF OF A CIIILD OR PATIENT UNABLE TO GIVE CONSENT **AGE** **SIGNATURE**

....

Name of Interviewer

.....

Signature of Interviewer

.....

Name of Consultant (Hospital Patients only)

.....

Date

.....

Serial No. of tape

.....

This form must be signed at the conclusion of the recording by all those who appear on the recording. In the case of young children, the parent or guardian should sign, or in the case of patients unable to give consent, their nearest relative should sign on their behalf.

The complete form should be filed in the patient's notes.

PLEASE NOTE that it is still necessary to inform the interviewees during the first part of the recording that a recording is being made, and that their written permission for its preservation will be requested at the end.

Child self-report questionnaire battery at two to four weeks post-trauma

How children and young people think and feel after being in a frightening event

Thank you for taking part in this study. Please read the following questionnaires and follow the instructions on each page.

Remember that there are no right or wrong answers – we are interested in what YOU think and feel. Just try and be as honest as possible.

If there is anything you do not understand then tell Richard who will help you.

Before you start, please could you write your name, date of birth, and today's date below.

Your name: _____

Your date of birth: _____

Today's date: _____

[PerCog-C]

What I felt and thought during the frightening event

Below is a list of thoughts or feelings. You may have had some of these when you had your frightening event.

Please read each one carefully and tell us how much you AGREE or DISAGREE with the sentence by circling one answer.

People react to frightening events in many different ways. There are no right or wrong answers to these sentences.

		Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
1.	I couldn't believe this was happening to me.	[ ]	[ ]	[ ]	[ ]
2.	I didn't feel like I was really there.	[ ]	[ ]	[ ]	[ ]
3	I didn't have any feelings about what was happening.	[ ]	[ ]	[ ]	[ ]
4.	I didn't understand what was happening.	[ ]	[ ]	[ ]	[ ]
5.	I really thought that I was going to die.	[ ]	[ ]	[ ]	[ ]
6.	I thought that I was going to be very badly hurt.	[ ]	[ ]	[ ]	[ ]
7.	I was really scared.	[ ]	[ ]	[ ]	[ ]
8.	I was scared that someone else might get badly hurt.	[ ]	[ ]	[ ]	[ ]
9.	It all felt like a dream.	[ ]	[ ]	[ ]	[ ]
10.	Just after the frightening event I was really angry with the people who caused the event.	[ ]	[ ]	[ ]	[ ]
11.	Just after the frightening event, I was really angry with myself.	[ ]	[ ]	[ ]	[ ]
12.	My mind went blank.	[ ]	[ ]	[ ]	[ ]

If there were any adults with you when the frightening event happened, we would also like to know how frightened they were. Please tick the box below that shows how frightened they were.

Not at all frightened	A bit frightened	Quite frightened	Very frightened
☐	☐	☐	☐

[RIES-C]

Below is a list of comments made by people after frightening events. Please check each item indicating how frequently these comments were true for you DURING THE PAST SEVEN DAYS. If they did not occur during that time, please mark the "not at all" column.

During the last seven days...	Not At All	Rarely	Some-times	Often
1. Do you think about it even when you don't mean to?	[ ]	[ ]	[ ]	[ ]
2. Do you try to remove it from your memory?	[ ]	[ ]	[ ]	[ ]
3. Do you have difficulties paying attention or concentrating?	[ ]	[ ]	[ ]	[ ]
4. Do you have waves of strong feeling about it?	[ ]	[ ]	[ ]	[ ]
5. Do you startle more easily or feel more nervous than you did before it happened?	[ ]	[ ]	[ ]	[ ]
6. Do you stay away from reminders of it (e.g. places or situations)?	[ ]	[ ]	[ ]	[ ]
7. Do you try not to talk about it?	[ ]	[ ]	[ ]	[ ]
8. Do pictures about it pop into your mind?	[ ]	[ ]	[ ]	[ ]
9. Do other things keep making you think about it?	[ ]	[ ]	[ ]	[ ]
10. Do you try not to think about it?	[ ]	[ ]	[ ]	[ ]
11. Do you get easily irritable?	[ ]	[ ]	[ ]	[ ]
12. Are you alert and watchful even when there is no obvious need to be?	[ ]	[ ]	[ ]	[ ]
13. Do you have sleep problems?	[ ]	[ ]	[ ]	[ ]

The statements below refer to how you have felt over the past week. There are no right answers but it is important to say how you have felt. Please answer as honestly as you can. Put a tick in the appropriate box. Thank you.

		Never	Sometimes	Most
1.	I look forward to things as much as I used to.	[ ]	[ ]	[ ]
2.	I sleep very well.	[ ]	[ ]	[ ]
3.	I feel like crying.	[ ]	[ ]	[ ]
4.	I like to go out to play.	[ ]	[ ]	[ ]
5.	I feel like running away.	[ ]	[ ]	[ ]
6.	I get tummy aches.	[ ]	[ ]	[ ]
7.	I have lots of energy.	[ ]	[ ]	[ ]
8.	I enjoy my food.	[ ]	[ ]	[ ]
9.	I can stick up for myself.	[ ]	[ ]	[ ]
10.	I think life isn't worth living.	[ ]	[ ]	[ ]
11.	I am good at things I do.	[ ]	[ ]	[ ]
12.	I enjoy the things I do as much as I used to.	[ ]	[ ]	[ ]
13.	I like talking with my family.	[ ]	[ ]	[ ]
14.	I have horrible dreams.	[ ]	[ ]	[ ]
15.	I feel very lonely.	[ ]	[ ]	[ ]
16.	I am easily cheered up.	[ ]	[ ]	[ ]
17.	I feel so sad I can hardly stand it.	[ ]	[ ]	[ ]
18.	I feel very bored.	[ ]	[ ]	[ ]

[MMQ]

Memory questionnaire

This is a questionnaire all about your memories of the frightening event. We would like to know what your memories feel and seem like. Please read each sentence and tell us how much you agree with each one, by ticking the appropriate box.

	Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
1. My memories of the frightening event are mostly pictures or images.	[ ]	[ ]	[ ]	[ ]
2. When I think about the frightening event it is just like thinking about anything else that has happened to me.	[ ]	[ ]	[ ]	[ ]
3. I can't seem to put the frightening event into words.	[ ]	[ ]	[ ]	[ ]
4. When I have memories of what happened I sometimes hear things in my head that I heard during the frightening event.	[ ]	[ ]	[ ]	[ ]
5. When I remember the frightening event I feel like it is happening right now.	[ ]	[ ]	[ ]	[ ]
6. When I think about the frightening event I can sometimes smell things that I smelt when the frightening event happened.	[ ]	[ ]	[ ]	[ ]
7. I can talk about what happened very easily.	[ ]	[ ]	[ ]	[ ]
8. I remember the frightening event as a few moments, and each moment is a picture in my mind.	[ ]	[ ]	[ ]	[ ]
9. My memories of the frightening event are like a film that plays over and over.	[ ]	[ ]	[ ]	[ ]
10. My memories of the frightening event are very clear and detailed.	[ ]	[ ]	[ ]	[ ]
11. Remembering what happened during the frightening event is just like looking at photographs of it in my mind.	[ ]	[ ]	[ ]	[ ]
12. I can remember the order in which things happened during the frightening event.	[ ]	[ ]	[ ]	[ ]
13. When memories come to mind of what happened, I feel my body is in the same position as when the frightening event occurred.	[ ]	[ ]	[ ]	[ ]
14. My memories of the frightening event feel like memories of other things that have happened to me that aren't very scary.	[ ]	[ ]	[ ]	[ ]

[cTCQ]

How I control unpleasant thoughts and memories

Most people have unpleasant and unwanted thoughts and memories, which can be difficult to control. These thoughts and memories can be like pictures or spoken words. We are interested in the techniques that you generally use to control these kinds of thoughts and memories.

Below are a number of things that people do to control these thoughts and memories. Please read each statement carefully, and indicate how often you use each technique by circling the appropriate number.

There are no right or wrong answers. Do not spend too much time thinking about each one.

When I have an unpleasant or unwanted thought or memory:

		Never	Some-times	Often	Almost always
1.	I try to think clearly about the thought or memory.	[ ]	[ ]	[ ]	[ ]
2.	I ask my friends if they have thoughts or memories like mine.	[ ]	[ ]	[ ]	[ ]
3.	I concentrate on the thought or memory.	[ ]	[ ]	[ ]	[ ]
4.	I do something that I enjoy.	[ ]	[ ]	[ ]	[ ]
5.	I don't talk about the thought or memory to anyone.	[ ]	[ ]	[ ]	[ ]
6.	I find out how my friends deal with these thoughts or memories.	[ ]	[ ]	[ ]	[ ]
7.	I get angry with myself for having the thought or memory.	[ ]	[ ]	[ ]	[ ]
8.	I keep myself busy.	[ ]	[ ]	[ ]	[ ]
9.	I keep the thought or memory to myself.	[ ]	[ ]	[ ]	[ ]
10.	I punish myself for thinking the thought or memory.	[ ]	[ ]	[ ]	[ ]
11.	I remember good times.	[ ]	[ ]	[ ]	[ ]
12.	I replace the thought with another bad thought or memory that isn't very important	[ ]	[ ]	[ ]	[ ]
13.	I shout at myself for having the thought or memory.	[ ]	[ ]	[ ]	[ ]
14.	I slap or pinch myself to stop the thought or memory.	[ ]	[ ]	[ ]	[ ]
15.	I talk to a friend about the thought or memory.	[ ]	[ ]	[ ]	[ ]
16.	I tell myself not to be so stupid.	[ ]	[ ]	[ ]	[ ]

Continued over page...

	Never	Some-times	Often	Almost always
17. I tell myself that something bad will happen if I have the thought or memory.	[ ]	[ ]	[ ]	[ ]
18. I think about nice things.	[ ]	[ ]	[ ]	[ ]
19. I think about other things that are bothering me.	[ ]	[ ]	[ ]	[ ]
20. I think about problems that aren't so important.	[ ]	[ ]	[ ]	[ ]
21. I think about something else which upsets me.	[ ]	[ ]	[ ]	[ ]
22. I think about something else.	[ ]	[ ]	[ ]	[ ]
23. I think about things that used to bother me.	[ ]	[ ]	[ ]	[ ]
24. I try a different way of thinking about it.	[ ]	[ ]	[ ]	[ ]
25. I try and do something around the house.	[ ]	[ ]	[ ]	[ ]
26. I try not to talk about the thought or memory.	[ ]	[ ]	[ ]	[ ]
27. I try to come up with a better thought or memory.	[ ]	[ ]	[ ]	[ ]
28. I try to see if the thought or memory is really true.	[ ]	[ ]	[ ]	[ ]
29. I wonder why I am having the thought or memory.	[ ]	[ ]	[ ]	[ ]
30. I worry about more minor things instead.	[ ]	[ ]	[ ]	[ ]

What I do when I feel sad or afraid

People think and do many different things when they feel sad or afraid.
Below is a list of things that people might think and do when they feel sad or afraid. We would like to know if you think or do any of these things. After each of these things are some answers.
Please tick the answer that you generally do.

		Never	Some-times	Often	Always
1.	I think about how lonely I feel.	[ ]	[ ]	[ ]	[ ]
2.	I think that I won't be able do my work at school because I feel so bad.	[ ]	[ ]	[ ]	[ ]
3.	I think about how tired and achy I feel.	[ ]	[ ]	[ ]	[ ]
4.	I think about how hard it is concentrate.	[ ]	[ ]	[ ]	[ ]
5.	I keep thinking about how fed-up I am.	[ ]	[ ]	[ ]	[ ]
6.	I think hard about the things that have made me sad or afraid.	[ ]	[ ]	[ ]	[ ]
7.	I think about how I don't care about anything anymore.	[ ]	[ ]	[ ]	[ ]
8.	I ask myself why I am not interested in anything.	[ ]	[ ]	[ ]	[ ]
9.	I wonder why I keep getting sad or afraid.	[ ]	[ ]	[ ]	[ ]
10.	I go away on my own and wonder why I feel like this.	[ ]	[ ]	[ ]	[ ]
11.	I write down what I am thinking.	[ ]	[ ]	[ ]	[ ]
12.	I think about things that have happened recently and wish they could have gone better.	[ ]	[ ]	[ ]	[ ]
13.	I wonder why I feel so different to other people.	[ ]	[ ]	[ ]	[ ]
14.	I keep thinking about how about sad or afraid I feel.	[ ]	[ ]	[ ]	[ ]
15.	I think about everything that is bad about me.	[ ]	[ ]	[ ]	[ ]
16.	I think about how I don't want to do anything.	[ ]	[ ]	[ ]	[ ]
17.	I wonder what is wrong with me for me to be afraid or sad.	[ ]	[ ]	[ ]	[ ]
18.	I go somewhere on my own and think about how I feel.	[ ]	[ ]	[ ]	[ ]
19.	I get angry with myself.	[ ]	[ ]	[ ]	[ ]
20.	I stay on my own and think about what is making me sad or afraid.	[ ]	[ ]	[ ]	[ ]
21.	I try and work out what part of me is making me sad or afraid.	[ ]	[ ]	[ ]	[ ]

Directions: A number of statements which boys and girls use to describe themselves are given below. Read each statement carefully and tick the box that is under the word that describes you.
There are no right or wrong answers. Remember; find the words that best describe you.

		None	Some	A lot
1.	I don't want other people to know when I feel afraid.	[ ]	[ ]	[ ]
2.	When I cannot keep my mind on my schoolwork I worry that I might be going crazy.	[ ]	[ ]	[ ]
3.	It scares me when I feel "shaky".	[ ]	[ ]	[ ]
4.	It scares me when I feel like I am going to faint.	[ ]	[ ]	[ ]
5.	It is important for me to stay in control of my feelings.	[ ]	[ ]	[ ]
6.	It scares me when my heart beats fast.	[ ]	[ ]	[ ]
7.	It embarrasses me when my stomach growls (makes noise).	[ ]	[ ]	[ ]
8.	It scares me when I feel like I am going to throw up.	[ ]	[ ]	[ ]
9.	When I notice that my heart is beating fast, I worry that there might be something wrong with me.	[ ]	[ ]	[ ]
10.	It scares me when I have trouble getting my breath.	[ ]	[ ]	[ ]
11.	When my stomach hurts, I worry that I might be really sick.	[ ]	[ ]	[ ]
12.	It scares me when I can't keep my mind on my schoolwork.	[ ]	[ ]	[ ]
13.	Other kids can tell when I feel shaky.	[ ]	[ ]	[ ]
14.	Unusual feelings in my body scare me.	[ ]	[ ]	[ ]
15.	When I am afraid, I worry that I might be crazy.	[ ]	[ ]	[ ]
16.	It scares me when I feel nervous.	[ ]	[ ]	[ ]
17.	I don't like to my feelings show.	[ ]	[ ]	[ ]
18.	Funny feelings in my body scare me.	[ ]	[ ]	[ ]

Feelings Questionnaire

Below are some sentences about feelings in general.

Please read each of the sentences carefully and tell us how much you AGREE or DISAGREE with the sentence by circling one answer.

There are no right or wrong answers to these sentences.

	Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
1. I think you should always keep your feelings under control.	[ ]	[ ]	[ ]	[ ]
2. I think you ought not to burden other people with your problems.	[ ]	[ ]	[ ]	[ ]
3. I think getting emotional is a sign that you are a wimp.	[ ]	[ ]	[ ]	[ ]
4. I think that people don't understand what anyone else is feeling.	[ ]	[ ]	[ ]	[ ]

[MCQ]

What I think about worrying

Nearly everyone worries about things from time to time. This questionnaire is about what people think of their worrying.
Listed below are a number of things people have said about worrying. Please read each item and indicate how much you generally agree with it by ticking the appropriate box.
Please respond to all of the items. There are no right or wrong answers.

		Do not agree	Agree slightly	Agree moderately	Agree very much
1.	I do my best thinking when I am worrying	[ ]	[ ]	[ ]	[ ]
2.	I need to worry in order to get things done	[ ]	[ ]	[ ]	[ ]
3.	I need to worry in order to stay organised	[ ]	[ ]	[ ]	[ ]
4.	I need to worry in order to work well	[ ]	[ ]	[ ]	[ ]
5.	I would be selfish if I never worried	[ ]	[ ]	[ ]	[ ]
6.	If I did not worry, I would make more mistakes	[ ]	[ ]	[ ]	[ ]
7.	If I do not worry my life will be less good	[ ]	[ ]	[ ]	[ ]
8.	If I stopped worrying, I would become rude and arrogant	[ ]	[ ]	[ ]	[ ]
9.	It would be stupid not to worry	[ ]	[ ]	[ ]	[ ]
10.	It's normal to worry	[ ]	[ ]	[ ]	[ ]
11.	My worrying thoughts are not helpful	[ ]	[ ]	[ ]	[ ]
12.	People who do not worry don't care about other people	[ ]	[ ]	[ ]	[ ]
13.	Worrying helps me cope	[ ]	[ ]	[ ]	[ ]
14.	Worrying helps me to avoid problems in the future	[ ]	[ ]	[ ]	[ ]
15.	Worrying helps me to avoid really bad things happening	[ ]	[ ]	[ ]	[ ]
16.	Worrying helps me to get things sorted out in my mind	[ ]	[ ]	[ ]	[ ]
17.	Worrying helps me to plan the future more better	[ ]	[ ]	[ ]	[ ]
18.	Worrying helps me to solve problems	[ ]	[ ]	[ ]	[ ]
19.	Worrying is a sign of a good person	[ ]	[ ]	[ ]	[ ]

Parent self-report questionnaire battery at two to four weeks post-trauma

How children and young people think and feel after being in a frightening event

Thank you for taking part in this study. Please read the following questionnaires and follow the instructions on each page.

There are no right or wrong answers, we are interested in what you think and feel.

Please could you write your name, your child's name, and today's date below.

Your name: _____

Your child's name: _____

Today's date: _____

Below is a list of sentences that may be thoughts or feelings that you had during or shortly after the event your child experienced.
Please read each sentence carefully and tell us how much you AGREE or DISAGREE with the sentence by ticking one box.
People react to frightening events in many different ways. There are no right or wrong answers to these sentences.

		Don't agree at all	Don't agree a bit	Agree a bit	Agree a lot
1.	I was really scared.	[ ]	[ ]	[ ]	[ ]
2.	Just after the event I was really angry with the people who caused the event.	[ ]	[ ]	[ ]	[ ]
3.	Just after the event, I was really angry with myself.	[ ]	[ ]	[ ]	[ ]

We would also like to know how your child seemed to react when the frightening event occurred. Please indicate below how distressed your child seemed during the frightening event.

Not at all frightened	A bit frightened	Quite frightened	Very frightened
[ ]	[ ]	[ ]	[ ]

If you were actually involved in the frightening event with your child, please read the sentences below also and tell us how much you AGREE or DISAGREE with the sentence by ticking one box.

		Don't agree at all	Don't agree a bit	Agree a bit	Agree a lot
1.	I didn't feel like I was really there.	[ ]	[ ]	[ ]	[ ]
2.	I couldn't believe this was happening to me.	[ ]	[ ]	[ ]	[ ]
3.	I really thought that I was going to die.	[ ]	[ ]	[ ]	[ ]
4.	It all felt like a dream.	[ ]	[ ]	[ ]	[ ]
5.	I was scared that someone else might get badly hurt.	[ ]	[ ]	[ ]	[ ]
6.	I didn't have any feelings about what was happening.	[ ]	[ ]	[ ]	[ ]
7.	I didn't understand what was happening.	[ ]	[ ]	[ ]	[ ]
8.	I thought that I was going to be very badly hurt.	[ ]	[ ]	[ ]	[ ]
9.	My mind went blank.	[ ]	[ ]	[ ]	[ ]

[PDS]

Below is a list of problems that people sometimes have after experiencing a frightening event. Read each one carefully and cast your mind back to the week that has just passed. First, choose the answer (0-3) that best describes HOW OFTEN that problem has bothered you IN THE PAST WEEK.

0	1	2	3
Not at all or only one time	Once per week/ Once in a while	2-4 times per week/ once in a while	5 times per week/ almost always

Next, rate how distressing each of the experiences has been in the past week using this 0-3 scale.

0	1	2	3
Not at all			Very distressing

1. Having upsetting thoughts or images about the frightening event that came into your head when you didn't want them to

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

2. Having bad dreams or nightmares about the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

3. Reliving the frightening event, acting or feeling as if it was happening again

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

4. Feeling emotionally upset when you were reminded of the frightening event (for example, feeling scared, angry, sad, guilty, etc.)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

5. Experiencing physical reactions when you were reminded of the frightening event (for example, breaking out in a sweat, heart beating fast)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

6. Trying not to think about, talk about, or have feelings about the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

7. Trying to avoid activities, people, or places that remind you of the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

8. Not being able to remember an important part of the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

9. Having much less interest or participating much less often in important activities

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

10. Feeling distant or cut off from people around you

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

11. Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

12. Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

13. Having trouble falling asleep

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

14. Feeling irritable

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

15. Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

16. Being overtly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

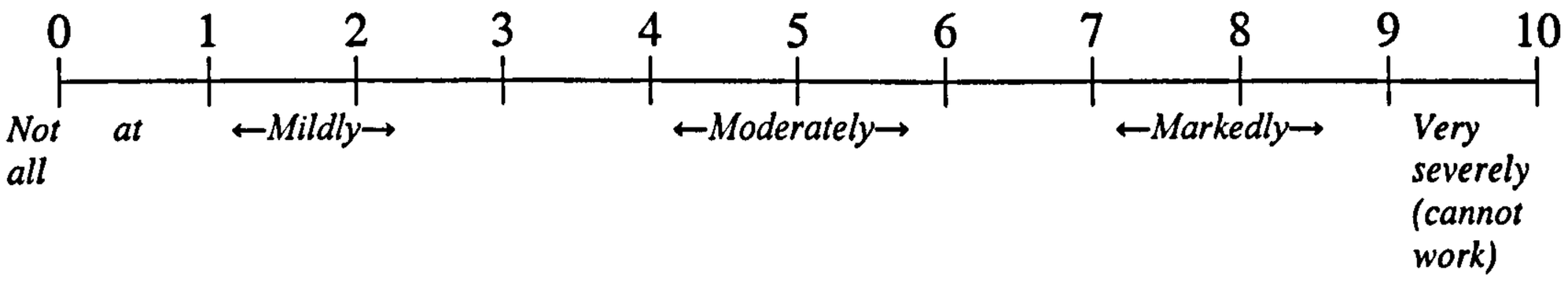
17. Being jumpy or easily startled

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

Please indicate how much the problems listed on the previous two pages have interrupted with your life. Circle the number that best describes your situation in the past week.

Work

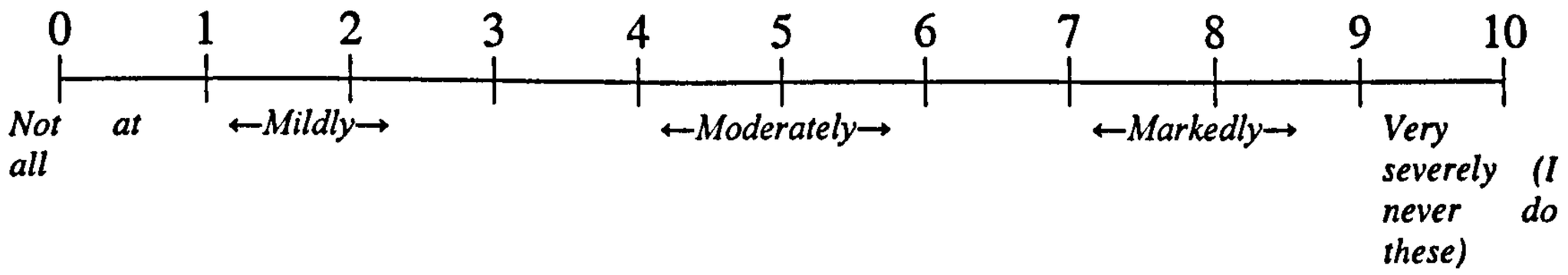
Because of my problems my work is impaired:



Social Life/Leisure Activities

(with other people at parties, socializing, visiting, dating, outings, clubs, entertaining)

Because of my problems my social life is impaired:



Family Life/Home Responsibilities
(relating to family members, paying bills, managing home, shopping and cleaning)
Because of my problems my family life/home responsibilities are impaired:

0 1 2 3 4 5 6 7 8 9 10

Not at all ←*Mildly*→ ←*Moderately*→ ←*Markedly*→ *Very severely (I never do these)*

Next, please rate how you feel about the frightening event at this moment:

When you think back about the frightening event and the things that followed it, how UPSET do you feel?

0 10 20 30 40 50 60 70 80 90 100

Not at all *Extremely*

To what extent do you think you have COME TO TERMS with the frightening event?

100 90 80 70 60 50 40 30 20 10 0

Completely *Not at all*

[BDI]

[Beck Depression Inventory entered here]

[MMQ]

Memory questionnaire

This is a questionnaire all about your memories of the frightening event. We would like to know what your memories feel and seem like. Please read each sentence and tell us how much you agree with each one, by ticking the appropriate box.

If you were *not* directly involved in the frightening event, please complete this questionnaire thinking about your memories of when you first found out what happened to your son or daughter.

	Don't agree at all	Don't agree a bit	Agree a bit	Completely agree
1. My memories of the frightening event are mostly pictures or images.	[ ]	[ ]	[ ]	[ ]
2. When I think about the frightening event it is just like thinking about anything else that has happened to me.	[ ]	[ ]	[ ]	[ ]
3. I can't seem to put the frightening event into words.	[ ]	[ ]	[ ]	[ ]
4. When I have memories of what happened I sometimes hear things in my head that I heard during the frightening event.	[ ]	[ ]	[ ]	[ ]
5. When I remember the frightening event I feel like it is happening right now.	[ ]	[ ]	[ ]	[ ]
6. When I think about the frightening event I can sometimes smell things that I smelt when the frightening event happened.	[ ]	[ ]	[ ]	[ ]
7. I can talk about what happened very easily.	[ ]	[ ]	[ ]	[ ]
8. I remember the frightening event as a few moments, and each moment is a picture in my mind.	[ ]	[ ]	[ ]	[ ]
9. My memories of the frightening event are like a film that plays over and over.	[ ]	[ ]	[ ]	[ ]
10. My memories of the frightening event are very clear and detailed.	[ ]	[ ]	[ ]	[ ]
11. Remembering what happened during the frightening event is just like looking at photographs of it in my mind.	[ ]	[ ]	[ ]	[ ]
12. I can remember the order in which things happened during the frightening event.	[ ]	[ ]	[ ]	[ ]
13. When memories come to mind of what happened, I feel my body is in the same position as when the frightening event occurred.	[ ]	[ ]	[ ]	[ ]
14. My memories of the frightening event feel like memories of other things that have happened to me that aren't very scary.	[ ]	[ ]	[ ]	[ ]

[TCQ]

How I cope with unpleasant and unwanted thoughts

Most people experience unpleasant, and/or unwanted thoughts (in verbal and/or picture form), which can be difficult to control. We are interested in the techniques that you generally use to control such thoughts. Below are a number of things that people do to control these thoughts.

Please read each statement carefully, and indicate how often you use each technique by circling the appropriate number. There are no right or wrong answers. Do not spend too much time thinking about each one.

When I experience and unpleasant/unwanted thought:

		Never	Some-times	Often	Almost always
1.	I analyse the thought rationally.	[ ]	[ ]	[ ]	[ ]
2.	I ask my friends if they have similar thoughts.	[ ]	[ ]	[ ]	[ ]
3.	I avoid discussing the thought.	[ ]	[ ]	[ ]	[ ]
4.	I call to mind positive images instead.	[ ]	[ ]	[ ]	[ ]
5.	I challenge the thought's validity.	[ ]	[ ]	[ ]	[ ]
6.	I do something that I enjoy.	[ ]	[ ]	[ ]	[ ]
7.	I don't talk about the thought to anyone.	[ ]	[ ]	[ ]	[ ]
8.	I dwell on other worries.	[ ]	[ ]	[ ]	[ ]
9.	I find out how my friends deal with these thoughts.	[ ]	[ ]	[ ]	[ ]
10.	I focus on different negative thoughts.	[ ]	[ ]	[ ]	[ ]
11.	I focus on the thought.	[ ]	[ ]	[ ]	[ ]
12.	I get angry at myself for having the thought.	[ ]	[ ]	[ ]	[ ]
13.	I keep myself busy.	[ ]	[ ]	[ ]	[ ]
14.	I keep the thought to myself.	[ ]	[ ]	[ ]	[ ]
15.	I occupy myself with work instead.	[ ]	[ ]	[ ]	[ ]
16.	I punish myself for thinking the thought.	[ ]	[ ]	[ ]	[ ]
17.	I question the reasons for having the thought.	[ ]	[ ]	[ ]	[ ]
18.	I replace the thought with a more trivial bad thought.	[ ]	[ ]	[ ]	[ ]
19.	I shout at myself for having the thought.	[ ]	[ ]	[ ]	[ ]
20.	I slap or pinch myself to stop the thought.	[ ]	[ ]	[ ]	[ ]
21.	I talk to a friend about the thought.	[ ]	[ ]	[ ]	[ ]

Continued over page...

		Never	Some-times	Often	Almost always
22.	I tell myself not to be so stupid.	[ ]	[ ]	[ ]	[ ]
23.	I tell myself that something bad will happen if I think the thought.	[ ]	[ ]	[ ]	[ ]
24.	I think about past worries instead.	[ ]	[ ]	[ ]	[ ]
25.	I think about something else.	[ ]	[ ]	[ ]	[ ]
26.	I think more about the more minor problems I have.	[ ]	[ ]	[ ]	[ ]
27.	I think pleasant thoughts instead.	[ ]	[ ]	[ ]	[ ]
28.	I try a different way of thinking about it.	[ ]	[ ]	[ ]	[ ]
29.	I try to re-interpret the thought.	[ ]	[ ]	[ ]	[ ]
30.	I worry about more minor things instead.	[ ]	[ ]	[ ]	[ ]

[RSQ]

Responses to sadness and being afraid

People think and do many different things when they feel sad or afraid. Please read each of the items below and indicate whether you never, sometimes, often, or always think or do each one when you feel sad or afraid. Please indicate what you *generally* do, not what you think you should do.

	Never	*Some-times*	*Often*	*Always*
1. I think about how alone I feel.	[ ]	[ ]	[ ]	[ ]
2. I think "I won't be able to do my job/work because I feel so badly".	[ ]	[ ]	[ ]	[ ]
3. I think about my feelings of fatigue and achiness.	[ ]	[ ]	[ ]	[ ]
4. I think about how hard it is to concentrate.	[ ]	[ ]	[ ]	[ ]
5. I think about how passive and unmotivated I feel.	[ ]	[ ]	[ ]	[ ]
6. I analyse recent events to try to understand why I am sad or afraid.	[ ]	[ ]	[ ]	[ ]
7. I think about how I don't seem to feel anything anymore.	[ ]	[ ]	[ ]	[ ]
8. I think "Why can't I get going?"	[ ]	[ ]	[ ]	[ ]
9. I think "Why do I always react this way?"	[ ]	[ ]	[ ]	[ ]
10. I go away by myself and think about why I feel this way.	[ ]	[ ]	[ ]	[ ]
11. I write down what I am thinking about and analyse it.	[ ]	[ ]	[ ]	[ ]
12. I think about a recent situation, wishing it would have gone better.	[ ]	[ ]	[ ]	[ ]
13. I think "Why do I have problems other people don't have?"	[ ]	[ ]	[ ]	[ ]
14. I think about how sad or afraid I feel.	[ ]	[ ]	[ ]	[ ]
15. I think about all my shortcomings, failings, faults, and mistakes.	[ ]	[ ]	[ ]	[ ]
16. I think about how I don't feel up to doing anything.	[ ]	[ ]	[ ]	[ ]
17. I analyse my personality to try to understand why I am sad or afraid.	[ ]	[ ]	[ ]	[ ]
18. I go some place alone to think about my feelings.	[ ]	[ ]	[ ]	[ ]
19. I think about how angry I am with myself.	[ ]	[ ]	[ ]	[ ]
20. I listen to sad music	[ ]	[ ]	[ ]	[ ]
21. I isolate myself and think about the reasons why I feel sad or afraid.	[ ]	[ ]	[ ]	[ ]
22. I try to understand myself by focusing on my sad or afraid feelings.	[ ]	[ ]	[ ]	[ ]

Circle the one phrase that best represents the extent to which you agree with the item. If any of the items concern something that is not part of your experience (e.g., "It scares me when I feel shaky" for someone who has never trembled or had the "shakes"), answer on the basis of how you think you might feel if you had such an experience. Otherwise answer all items on the basis of your experience.

		Very little	A little	Some	Much	Very much
1.	It is important to me not to appear nervous.	[ ]	[ ]	[ ]	[ ]	[ ]
2.	When I cannot keep my mind on a task, I worry that I might be going crazy	[ ]	[ ]	[ ]	[ ]	[ ]
3.	It scares me when I feel 'shaky' (trembling)	[ ]	[ ]	[ ]	[ ]	[ ]
4.	It scares me when I feel faint	[ ]	[ ]	[ ]	[ ]	[ ]
5.	It is important to me to stay in control of my emotions	[ ]	[ ]	[ ]	[ ]	[ ]
6.	It scares me when my heart beats rapidly	[ ]	[ ]	[ ]	[ ]	[ ]
7.	It embarrasses me when my stomach growls	[ ]	[ ]	[ ]	[ ]	[ ]
8.	It scares me when I am nauseous	[ ]	[ ]	[ ]	[ ]	[ ]
9.	When I notice that my heart is beating rapidly, I worry that I might have a heart attack	[ ]	[ ]	[ ]	[ ]	[ ]
10.	It scares me when I become short of breath	[ ]	[ ]	[ ]	[ ]	[ ]
11.	When my stomach is upset, I worry that I might be seriously ill	[ ]	[ ]	[ ]	[ ]	[ ]
12.	It scares me when I am unable to keep my mind on a task	[ ]	[ ]	[ ]	[ ]	[ ]
13.	Other people notice when I feel shaky	[ ]	[ ]	[ ]	[ ]	[ ]
14.	Unusual body sensations scare me	[ ]	[ ]	[ ]	[ ]	[ ]
15.	When I am nervous, I worry that I might be mentally ill	[ ]	[ ]	[ ]	[ ]	[ ]
16.	It scares me when I am nervous	[ ]	[ ]	[ ]	[ ]	[ ]

Feelings Questionnaire

Below are some sentences about feelings in general.

Please read each of the sentences carefully and tell us how much you AGREE or DISAGREE with the sentence by ticking one box.

There are no right or wrong answers to these sentences.

		Don't agree at all	agree very much	Agree a bit	Agree a lot
1.	I think you should always keep your feelings under control.	[ ]	[ ]	[ ]	[ ]
2.	I think you ought not to burden other people with your problems.	[ ]	[ ]	[ ]	[ ]
3.	I think getting emotional is a sign of weakness.	[ ]	[ ]	[ ]	[ ]
4.	I think other people don't understand your feelings.	[ ]	[ ]	[ ]	[ ]

[MCQ]

What I think about worrying

This questionnaire is concerned with beliefs people have about their worrying. Listed below are a number of beliefs people have expressed.
Please read each item and indicate how much you generally agree with it by ticking the appropriate box. Please respond to all of the items. There are no right or wrong answers.

		Do not agree	Agree slightly	Agree moderately	Agree very much
1.	I do my clearest thinking when I am worrying	[ ]	[ ]	[ ]	[ ]
2.	I need to worry in order to get things done	[ ]	[ ]	[ ]	[ ]
3.	I need to worry in order to remain organised	[ ]	[ ]	[ ]	[ ]
4.	I need to worry in order to work well	[ ]	[ ]	[ ]	[ ]
5.	I will lose out in life I do not worry	[ ]	[ ]	[ ]	[ ]
6.	I would be selfish if I never worried	[ ]	[ ]	[ ]	[ ]
7.	If I did not worry, I would make more mistakes	[ ]	[ ]	[ ]	[ ]
8.	If I stopped worrying, I would become glib, arrogant, and offensive	[ ]	[ ]	[ ]	[ ]
9.	It would be stupid and complacent not to worry	[ ]	[ ]	[ ]	[ ]
10.	It would not be normal if I did not worry	[ ]	[ ]	[ ]	[ ]
11.	My worrying thoughts are not productive	[ ]	[ ]	[ ]	[ ]
12.	People who do not worry have no depth	[ ]	[ ]	[ ]	[ ]
13.	Worrying helps me cope	[ ]	[ ]	[ ]	[ ]
14.	Worrying helps me to avoid disastrous situations	[ ]	[ ]	[ ]	[ ]
15.	Worrying helps me to avoid problems in the future	[ ]	[ ]	[ ]	[ ]
16.	Worrying helps me to get things sorted out in my mind	[ ]	[ ]	[ ]	[ ]
17.	Worrying helps me to plan the future more effectively	[ ]	[ ]	[ ]	[ ]
18.	Worrying helps me to solve problems	[ ]	[ ]	[ ]	[ ]
19.	Worrying is a sign of a good person	[ ]	[ ]	[ ]	[ ]

[STAI]

A number of statements which people have used to describe themselves are given below. Read each statement and then tick the appropriate box to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately so	Very much so
1.	I feel calm.	[ ]	[ ]	[ ]	[ ]
2.	I feel secure.	[ ]	[ ]	[ ]	[ ]
3.	I am tense.	[ ]	[ ]	[ ]	[ ]
4.	I am strained.	[ ]	[ ]	[ ]	[ ]
5.	I feel at ease.	[ ]	[ ]	[ ]	[ ]
6.	I feel upset.	[ ]	[ ]	[ ]	[ ]
7.	I am presently worrying over possible misfortunes.	[ ]	[ ]	[ ]	[ ]
8.	I feel satisfied.	[ ]	[ ]	[ ]	[ ]
9.	I feel frightened.	[ ]	[ ]	[ ]	[ ]
10.	I feel comfortable.	[ ]	[ ]	[ ]	[ ]
11.	I feel self-confident.	[ ]	[ ]	[ ]	[ ]
12.	I feel nervous.	[ ]	[ ]	[ ]	[ ]
13.	I am jittery.	[ ]	[ ]	[ ]	[ ]
14.	I feel indecisive.	[ ]	[ ]	[ ]	[ ]
15.	I am relaxed.	[ ]	[ ]	[ ]	[ ]
16.	I feel content.	[ ]	[ ]	[ ]	[ ]
17.	I am worried.	[ ]	[ ]	[ ]	[ ]
18.	I feel confused.	[ ]	[ ]	[ ]	[ ]
19.	I feel steady.	[ ]	[ ]	[ ]	[ ]
20.	I feel pleasant.	[ ]	[ ]	[ ]	[ ]

Child or Young Person's Booklet

How children and young people think and feel after being in a frightening event

Thank you for taking part in this study. Please read the following questionnaires and follow the instructions on each page.

Remember that there are no right or wrong answers – we are interested in what YOU think and feel. Just try and be as honest as possible.

Before you start, please could you write your name, date of birth, and today's date below.

Your name: _____

Your date of birth: _____

Today's date: _____

Below is a list of comments made by people after frightening events. Please check each item indicating how frequently these comments were true for you DURING THE PAST SEVEN DAYS. If they did not occur during that time, please mark the "not at all" column.

During the last seven days...	Not At All	Rarely	Some-times	Often
1. Do you think about it even when you don't mean to?	[ ]	[ ]	[ ]	[ ]
2. Do you try to remove it from your memory?	[ ]	[ ]	[ ]	[ ]
3. Do you have difficulties paying attention or concentrating?	[ ]	[ ]	[ ]	[ ]
4. Do you have waves of strong feeling about it?	[ ]	[ ]	[ ]	[ ]
5. Do you startle more easily or feel more nervous than you did before it happened?	[ ]	[ ]	[ ]	[ ]
6. Do you stay away from reminders of it (e.g. places or situations)?	[ ]	[ ]	[ ]	[ ]
7. Do you try not to talk about it?	[ ]	[ ]	[ ]	[ ]
8. Do pictures about it pop into your mind?	[ ]	[ ]	[ ]	[ ]
9. Do other things keep making you think about it?	[ ]	[ ]	[ ]	[ ]
10. Do you try not to think about it?	[ ]	[ ]	[ ]	[ ]
11. Do you get easily irritable?	[ ]	[ ]	[ ]	[ ]
12. Are you alert and watchful even when there is no obvious need to be?	[ ]	[ ]	[ ]	[ ]
13. Do you have sleep problems?	[ ]	[ ]	[ ]	[ ]

Below is a list of problems that children and young people sometimes have after experiencing a frightening event. Read each one carefully and circle the number (0–3) that best describes how often that problem has bothered you in the last 2 weeks.

0	1	2	3
Not at all or only one time	Once a week or less/once in a while	2 to 4 times a week/half the time	5 or more times a week/almost always

(1) 0 1 2 3 Having upsetting thoughts or images about the event that came into your head when you didn't want them to

(2) 0 1 2 3 Having bad dreams or nightmares

(3) 0 1 2 3 Acting or feeling as if the event was happening again (hearing something or seeing a picture about it and feeling as if I am there again)

(4) 0 1 2 3 Feeling upset when you think or hear about the event (for example, feeling scared, angry, sad, guilty etc)

(5) 0 1 2 3 Having feelings in your body when you think about or hear about the event (for example, breaking out in a sweat, heart beating fast)

(6) 0 1 2 3 Trying not to think about, talk about, or have feelings about the event

(7) 0 1 2 3 Trying to avoid activities, people, or places that remind you of the traumatic event

(8) 0 1 2 3 Not being able to remember an important part of the upsetting event

(9) 0 1 2 3 Having much less interest or not doing the things you used to do

(10) 0 1 2 3 Not feeling close to people around you

(11) 0 1 2 3 Not being able to have strong feelings (for example, being unable to cry or unable to feel very happy)

(12) 0 1 2 3 Feeling as if your future plans or hopes will not come true (for example, you will not have a job or get married or have kids)

0	1	2	3
Not at all or only one time	Once a week or less/once in a while	2 to 4 times a week/half the time	5 or more times a week/almost always

(13) 0 1 2 3 Having trouble falling or staying asleep

(14) 0 1 2 3 Feeling irritable or having fits of anger

(15) 0 1 2 3 Having trouble concentrating (for example, losing track of a story on television, forgetting what you read, not paying attention in class)

(16) 0 1 2 3 Being overly careful (for example, checking to see who is around you and what is around you)

(17) 0 1 2 3 Being jumpy or easily startled (for example, when someone walks up behind you)

Please indicate below if the problems you rated above have got in the way of any of the following areas of your life during the past 2 weeks. Circle Y for Yes, N for No.

(18) Y N Fun and hobby activities

(19) Y N Relationships with your friends

(20) Y N Schoolwork

(21) Y N Relationship with your family

(22) Y N Chores and duties at home

(23) Y N General happiness with your life

The statements below refer to how you have felt over the past week. There are no right answers but it is important to say how you have felt. Please answer as honestly as you can. Put a tick in the appropriate box. Thank you.

		Never	Sometimes	Most
1.	I look forward to things as much as I used to.	[ ]	[ ]	[ ]
2.	I sleep very well.	[ ]	[ ]	[ ]
3.	I feel like crying.	[ ]	[ ]	[ ]
4.	I like to go out to play.	[ ]	[ ]	[ ]
5.	I feel like running away.	[ ]	[ ]	[ ]
6.	I get tummy aches.	[ ]	[ ]	[ ]
7.	I have lots of energy.	[ ]	[ ]	[ ]
8.	I enjoy my food.	[ ]	[ ]	[ ]
9.	I can stick up for myself.	[ ]	[ ]	[ ]
10.	I think life isn't worth living.	[ ]	[ ]	[ ]
11.	I am good at things I do.	[ ]	[ ]	[ ]
12.	I enjoy the things I do as much as I used to.	[ ]	[ ]	[ ]
13.	I like talking with my family.	[ ]	[ ]	[ ]
14.	I have horrible dreams.	[ ]	[ ]	[ ]
15.	I feel very lonely.	[ ]	[ ]	[ ]
16.	I am easily cheered up.	[ ]	[ ]	[ ]
17.	I feel so sad I can hardly stand it.	[ ]	[ ]	[ ]
18.	I feel very bored.	[ ]	[ ]	[ ]

[cPTCI]

How I've been thinking and feeling since the frightening event

We would like to know what kinds of thoughts and feelings you've been having after the frightening event.
Below is a list of statements. Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement by ticking one box.
People react to frightening events in many different ways. There are no right or wrong answers to these statements.

		Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
1.	Anger will make me lose control.	[ ]	[ ]	[ ]	[ ]
2.	Anyone could hurt me.	[ ]	[ ]	[ ]	[ ]
3.	Bad things always happen.	[ ]	[ ]	[ ]	[ ]
4.	Everyone lets me down.	[ ]	[ ]	[ ]	[ ]
5.	I am a coward.	[ ]	[ ]	[ ]	[ ]
6.	I am always going to cause frightening events.	[ ]	[ ]	[ ]	[ ]
7.	I am different to other kids because of what happened to me.	[ ]	[ ]	[ ]	[ ]
8.	I am no good.	[ ]	[ ]	[ ]	[ ]
9.	I can't cope when things get tough.	[ ]	[ ]	[ ]	[ ]
10.	I can't stop bad things from happening to me.	[ ]	[ ]	[ ]	[ ]
11.	I don't have any feelings.	[ ]	[ ]	[ ]	[ ]
12.	I don't think I'm coping as well as I should.	[ ]	[ ]	[ ]	[ ]
13.	I don't trust people.	[ ]	[ ]	[ ]	[ ]
14.	I feel like a robot sometimes.	[ ]	[ ]	[ ]	[ ]
15.	I feel like I am a different person since the frightening event.	[ ]	[ ]	[ ]	[ ]
16.	I had a feeling the frightening event was going to happen.	[ ]	[ ]	[ ]	[ ]
17.	I have no future.	[ ]	[ ]	[ ]	[ ]
18.	I have to be really careful because something bad could happen.	[ ]	[ ]	[ ]	[ ]
19.	I have to watch out for danger all the time.	[ ]	[ ]	[ ]	[ ]
20.	I helped make the frightening event happen.	[ ]	[ ]	[ ]	[ ]
21.	I knew that the frightening event would happen.	[ ]	[ ]	[ ]	[ ]

Continued over page...

	Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
22. I must control my thoughts and feelings about the frightening event or I will go crazy.	[ ]	[ ]	[ ]	[ ]
23. I used to be a happy person but now I am always sad.	[ ]	[ ]	[ ]	[ ]
24. I will always be angry with the people who caused the frightening event.	[ ]	[ ]	[ ]	[ ]
25. I will never be able to have normal feelings again.	[ ]	[ ]	[ ]	[ ]
26. I'm scared that I'll get so angry that I'll break something or hurt someone.	[ ]	[ ]	[ ]	[ ]
27. I'm the kind of person who always gets into trouble.	[ ]	[ ]	[ ]	[ ]
28. If I avoid things after the frightening event it means I am a coward.	[ ]	[ ]	[ ]	[ ]
29. If I let out my feelings bad things will happen.	[ ]	[ ]	[ ]	[ ]
30. If I was a better person, I could have stopped the frightening event from happening.	[ ]	[ ]	[ ]	[ ]
31. Life is not fair.	[ ]	[ ]	[ ]	[ ]
32. My friends at school wouldn't have got involved in frightening events.	[ ]	[ ]	[ ]	[ ]
33. My life has been destroyed by the frightening event.	[ ]	[ ]	[ ]	[ ]
34. My reactions since the frightening event mean I have changed for the worse.	[ ]	[ ]	[ ]	[ ]
35. My reactions since the frightening event mean I will never get over it.	[ ]	[ ]	[ ]	[ ]
36. My reactions since the frightening event mean something is seriously wrong with me.	[ ]	[ ]	[ ]	[ ]
37. My reactions since the frightening event show that I must be going crazy.	[ ]	[ ]	[ ]	[ ]
38. No one understands me anymore.	[ ]	[ ]	[ ]	[ ]
39. Not being able to get over all my fears means that I am a failure.	[ ]	[ ]	[ ]	[ ]
40. Nothing good can happen to me anymore.	[ ]	[ ]	[ ]	[ ]
41. Small things upset me.	[ ]	[ ]	[ ]	[ ]
42. Someone should be punished for what happened to me.	[ ]	[ ]	[ ]	[ ]

Continued over page...

	Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
43. Something terrible will happen if I do not try to control my thoughts about the frightening event.	[ ]	[ ]	[ ]	[ ]
44. The frightening event happened as a punishment for me.	[ ]	[ ]	[ ]	[ ]
45. The frightening event has changed me forever.	[ ]	[ ]	[ ]	[ ]
46. The world is a dangerous place.	[ ]	[ ]	[ ]	[ ]
47. What happened to me is really unfair.	[ ]	[ ]	[ ]	[ ]

People who have been in frightening events or have had close friends and family involved in frightening events, sometimes may have painful and scary memories or distressing thoughts about what happened. Sometimes people try to push these thoughts and memories out of their minds. Sometimes people will try to think about something else instead. We would like to know how much you try to do these things.

Read the sentences below carefully and tick the box that says how much you agree or do not agree with it.

	Disagree a lot	Disagree a bit	Agree a bit	Agree a lot
1. When I have thoughts or memories about what happened, I try hard to *push them* out of my mind.	[ ]	[ ]	[ ]	[ ]
2. When I have thoughts or memories about what happened, I try hard to think about something else.	[ ]	[ ]	[ ]	[ ]

After frightening events, people may think a lot about what has happened. Here are some thoughts that people have had about frightening things.
We would like to know if you've had thoughts like these. Please read each of the sentences below, and tick the box that says how often you've had thoughts like these.

	Never	Some-times	Often	Almost always
1. I keep wishing that I could go back in time and prevent the event from happening.	[ ]	[ ]	[ ]	[ ]
2. Whenever I think of the event I wonder why it happened to us.	[ ]	[ ]	[ ]	[ ]
3. I am always wondering if my family or I might get hurt again.	[ ]	[ ]	[ ]	[ ]

[RCMAS]

What I think and feel

Read each question carefully. Put a circle around the word YES if you think it is true about you. Put a circle around the word NO if you think it is not true about you.

1.	I have trouble making up my mind.	Yes	No
2.	I get nervous when things do not go the right way for me.	Yes	No
3.	Others seem to do things easier than I can.	Yes	No
4.	I like everyone I know.	Yes	No
5.	Often I have trouble getting my breath.	Yes	No
6.	I worry a lot of the time.	Yes	No
7.	I am afraid of a lot of things.	Yes	No
8.	I am always kind.	Yes	No
9.	I get mad easily.	Yes	No
10.	I worry about what my parents will say to me.	Yes	No
11.	I feel that others do not like the way I do things.	Yes	No
12.	I always have good manners.	Yes	No
13.	It is hard for me to get to sleep at night.	Yes	No
14.	I worry about what other people think about me.	Yes	No
15.	I feel alone even when there are people with me.	Yes	No
16.	I am always good.	Yes	No
17.	Often I feel sick in my stomach.	Yes	No
18.	My feelings get hurt easily.	Yes	No
19.	My hands feel sweaty.	Yes	No
20.	I am always nice to everyone.	Yes	No
21.	I am tired a lot.	Yes	No
22.	I worry about what is going to happen.	Yes	No
23.	Other children are happier than I.	Yes	No
24.	I tell the truth every single time.	Yes	No
25.	I have bad dreams	Yes	No
26.	My feelings get hurt easily when I am fussed at.	Yes	No
27.	I feel someone will tell me I do things the wrong way.	Yes	No
28.	I never get angry.	Yes	No
29.	I wake up scared some of the time.	Yes	No
30.	I worry when I go to bed at night.	Yes	No
31.	It is hard for me to keep my mind on my schoolwork.	Yes	No
32.	I never say things I shouldn't.	Yes	No
33.	I wiggle in my seat a lot.	Yes	No
34.	I am nervous.	Yes	No
35.	A lot of people are against me.	Yes	No
36.	I never lie.	Yes	No
37.	I often worry about something bad happening to me.	Yes	No

Parent's Booklet

How children and young people think and feel after being in a frightening event

Thank you for taking part in this study. Please read the following questionnaires and follow the instructions on each page.

There are no right or wrong answers, we are interested in what you think and feel.

Please could you write your name, your child's name, and today's date below.

Your name: _____

Your child's name: _____

Today's date: _____

[PDS]

Below is a list of problems that people sometimes have after experiencing a frightening event. Read each one carefully and cast your mind back to the week that has just passed. First, choose the answer (0-3) that best describes HOW OFTEN that problem has bothered you IN THE PAST WEEK.

0	1	2	3
Not at all or only one time	Once per week/ once in a while	2-4 times per week/ once in a while	5 times per week/ almost always

Next, rate how distressing each of the experiences has been in the past week using this 0-3 scale.

0	1	2	3
Not at all			Very distressing

1. Having upsetting thoughts or images about the frightening event that came into your head when you didn't want them to

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

2. Having bad dreams or nightmares about the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

3. Reliving the frightening event, acting or feeling as if it was happening again

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

4. Feeling emotionally upset when you were reminded of the frightening event (for example, feeling scared, angry, sad, guilty, etc.)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

5. Experiencing physical reactions when you were reminded of the frightening event (for example, breaking out in a sweat, heart beating fast)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

6. Trying not to think about, talk about, or have feelings about the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

7. Trying to avoid activities, people, or places that remind you of the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

8. Not being able to remember an important part of the frightening event

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

9. Having much less interest or participating much less often in important activities

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

10. Feeling distant or cut off from people around you

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

11. Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

12. Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

13. Having trouble falling asleep

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

14. Feeling irritable

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

15. Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

16. Being overtly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

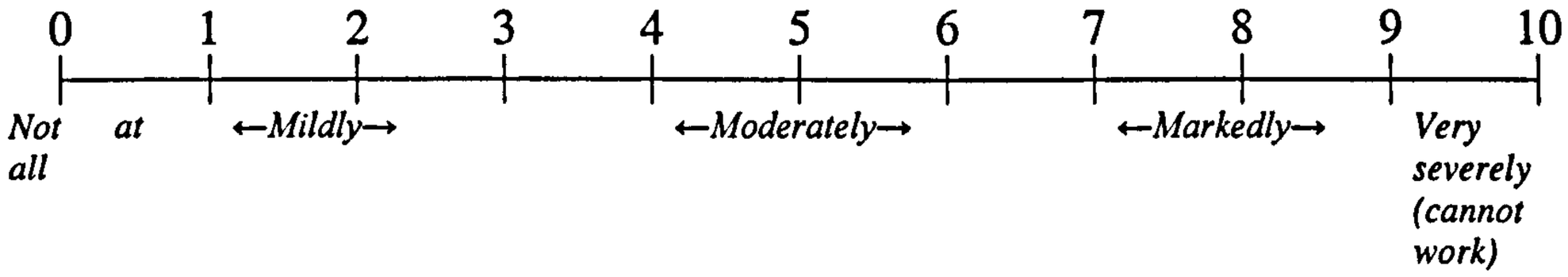
17. Being jumpy or easily startled

How often? 0 1 2 3 How distressing has this been? 0 1 2 3

Please indicate how much the problems listed on the previous two pages have interrupted with your life. Circle the number that best describes your situation in the past week.

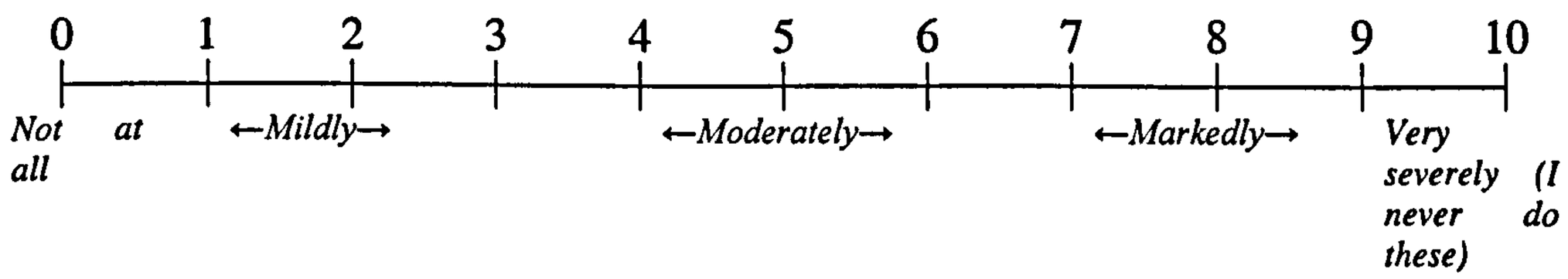
Work

Because of my problems my work is impaired:

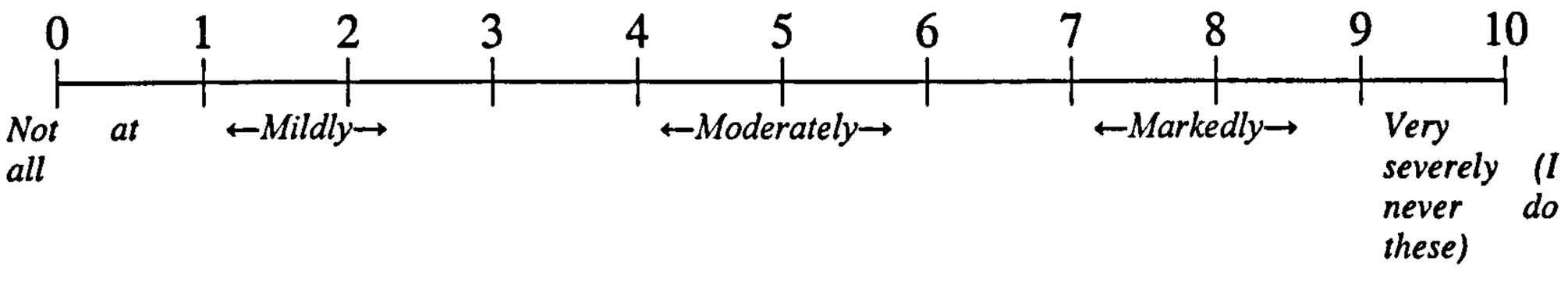


Social Life/Leisure Activities
(with other people at parties, socializing, visiting, dating, outings, clubs, entertaining)

Because of my problems my social life is impaired:

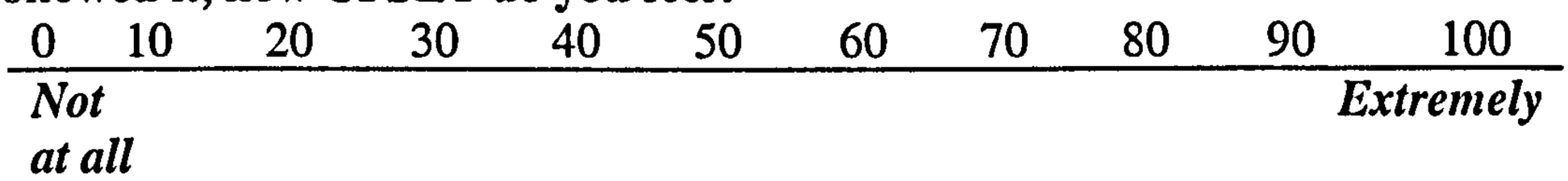


Family Life/Home Responsibilities
(relating to family members, paying bills, managing home, shopping and cleaning)
Because of my problems my family life/home responsibilities are impaired:

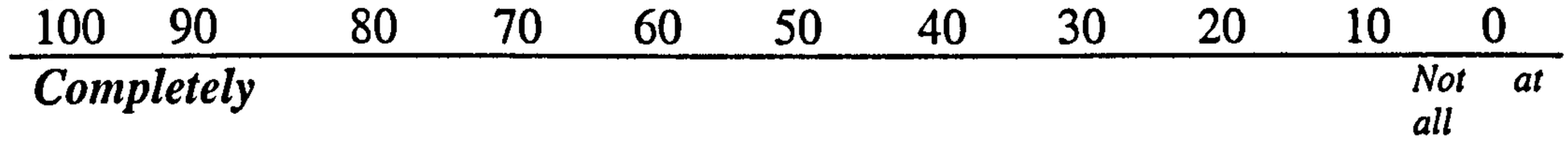


Next, please rate how you feel about the frightening event at this moment:

When you think back about the frightening event and the things that followed it, how UPSET do you feel?



To what extent do you think you have COME TO TERMS with the frightening event?



[BDI]

[Beck Depression Inventory entered here]

[TDR]

People who have been in frightening events or have had close friends and family involved in frightening events, sometimes may have painful and scary memories or distressing thoughts about what happened. Sometimes people try to push such thoughts and memories out of their minds. Sometimes people will try to think about something else instead. We would like to know how much you try to do these things.

Read the sentences below and tick the box that says how much you agree or do not agree with it.

	Don't agree at all	Disagree slightly	Agree slightly	Completely agree
1. When I have thoughts or memories about what happened, I try hard to push them out of my mind.	[ ]	[ ]	[ ]	[ ]
2. When I have thoughts or memories about what happened, I try hard to think about something else.	[ ]	[ ]	[ ]	[ ]

After frightening events, people may think a lot about what has happened. Here are some thoughts that people have had about such frightening things.
We would like to know if you've had thoughts like these. Please read each of the sentences below, and tick the box that says how often you've had thoughts like these.

	Never	Some-times	Often	Almost always
1. I keep wishing that I could go back in time and prevent the event from happening.	[ ]	[ ]	[ ]	[ ]
2. Whenever I think of the event I wonder why it happened to us.	[ ]	[ ]	[ ]	[ ]
3. I am always wondering if my family or I might get hurt again.	[ ]	[ ]	[ ]	[ ]

[FFQ]

Below are a series of statements about your family since the frightening event. For each statement please put a cross in the box that best fits your situation.

		Does not apply	Applies somewhat	Certainly applies
1.	We are closer than before	[ ]	[ ]	[ ]
2.	We are more irritable	[ ]	[ ]	[ ]
3.	We are more withdrawn.	[ ]	[ ]	[ ]
4.	We argue more.	[ ]	[ ]	[ ]
5.	We avoid upsetting issues.	[ ]	[ ]	[ ]
6.	We find it harder to enjoy things.	[ ]	[ ]	[ ]
7.	We have a better sense of goals.	[ ]	[ ]	[ ]
8.	We have less contact with relatives.	[ ]	[ ]	[ ]
9.	We spend less time together.	[ ]	[ ]	[ ]
10.	We talk over problems.	[ ]	[ ]	[ ]
11.	We worry about strain.	[ ]	[ ]	[ ]

Below are two questions about what you personally have been thinking since the frightening event. Please tick the appropriate box.

		Not at all	Some-times	Often
1.	Since the frightening event, do you worry more about your children coming to harm?	[ ]	[ ]	[ ]
2.	Do you need to know where your children are more than before?	[ ]	[ ]	[ ]

A number of statements which people have used to describe themselves are given below. Read each statement and then tick the appropriate box to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately so	Very much so
1.	I feel calm.	[ ]	[ ]	[ ]	[ ]
2.	I feel secure.	[ ]	[ ]	[ ]	[ ]
3.	I am tense.	[ ]	[ ]	[ ]	[ ]
4.	I am strained.	[ ]	[ ]	[ ]	[ ]
5.	I feel at ease.	[ ]	[ ]	[ ]	[ ]
6.	I feel upset.	[ ]	[ ]	[ ]	[ ]
7.	I am presently worrying over possible misfortunes.	[ ]	[ ]	[ ]	[ ]
8.	I feel satisfied.	[ ]	[ ]	[ ]	[ ]
9.	I feel frightened.	[ ]	[ ]	[ ]	[ ]
10.	I feel comfortable.	[ ]	[ ]	[ ]	[ ]
11.	I feel self-confident.	[ ]	[ ]	[ ]	[ ]
12.	I feel nervous.	[ ]	[ ]	[ ]	[ ]
13.	I am jittery.	[ ]	[ ]	[ ]	[ ]
14.	I feel indecisive.	[ ]	[ ]	[ ]	[ ]
15.	I am relaxed.	[ ]	[ ]	[ ]	[ ]
16.	I feel content.	[ ]	[ ]	[ ]	[ ]
17.	I am worried.	[ ]	[ ]	[ ]	[ ]
18.	I feel confused.	[ ]	[ ]	[ ]	[ ]
19.	I feel steady.	[ ]	[ ]	[ ]	[ ]
20.	I feel pleasant.	[ ]	[ ]	[ ]	[ ]

Appendix C – Article published from the body of the thesis

Meiser-Stedman, R. (2002). Towards a Cognitive–Behavioral Model of PTSD in Children and Adolescents. *Clinical Child and Family Psychology Review, 5*, 217-232.

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Towards a Cognitive–Behavioral Model of PTSD in Children and Adolescents

Richard Meiser-Stedman[1]

Posttraumatic stress disorder in children and adolescents has been studied only for the past 15–20 years and is the subject of a burgeoning corpus of research. Much research has focused on examining whether children and adolescents have the same responses to trauma as those experienced by adults. Many of the research tools used to investigate children's responses are taken from measures designed for use with adults, and these measures have proven to be useful. However, it has not been established that children's responses to traumatic events are related to the same underlying processes as are adults' responses. The possible application of 2 recent cognitive models of PTSD in adults to understanding PTSD in children and adolescents is discussed in this paper, within the context of what is already known about children's reaction to trauma and existing theoretical accounts of childhood PTSD. Particular attention is paid toward the nature of children's memories of traumatic events and how these memories relate to the reexperiencing symptoms of PTSD, and cognitive processes that may play a role in the maintenance of PTSD. It is proposed that the adoption of a more specific cognitive–behavioral framework in the study of this disorder may be beneficial and lead to better treatment outcomes.

KEY WORDS: posttraumatic stress disorder; children; cognitive–behavioral model; traumatic memories; maintenance.

INTRODUCTION

It has been acknowledged only during the past 15 years or so that children and adolescents may suffer from posttraumatic stress disorder (PTSD). In one of the earliest considerations of children's responses to trauma, Garmezy and Rutter (1985) concluded that children's reactions to trauma were not as serious as those developed by adults, and that children's reactions did not warrant inclusion within a diagnostic category of PTSD. This was due particularly to there being no reports that children exposed to disasters displayed PTSD-specific symptoms such as amnesia, psychic numbing, or intrusive flashbacks.

Particular barriers to the understanding of children's reactions to traumatic events were quickly highlighted. Yule and Williams (1990) pointed out that studies of children exposed to trauma are difficult to conduct because of the tendency of adults to be highly protective toward such children and deny that children can suffer psychiatric disturbance following trauma. In addition, these authors noted that one of the earliest studies (Galante & Foa, 1986) had not used scales appropriate for detection of traumatic stress reactions in children.

A more detailed understanding of PTSD in children and adolescents was derived from the use of assessment measures designed specifically for PTSD. The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979) was utilized in a study of children involved in the *Herald of Free Enterprise* ferry disaster (Yule & Williams, 1990). Children assessed using this self-report measure were found to score in a similar fashion to adults. The PTSD Reaction Index (PTSD-RI), a structured interview based on the *DSM-III* diagnostic criteria for PTSD, was used by Pynoos et al.

[1]Department of Psychology, Institute of Psychiatry, De Crespigny Park, Denmark Hill, London SE5 8AF, United Kingdom; e-mail: r.meiser-stedman@iop.kcl.ac.uk.

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(1987) to assess children who had witnessed a fatal sniper attack on their school playground. Children in the playground at the time of the shooting were very likely to develop PTSD, with 77% developing moderate-to-severe levels of PTSD.

These key articles that helped to bring about an acceptance of the validity of the PTSD diagnosis in children utilized scales and interviews based on diagnostic criteria initially designed for adults. The study of reactions to traumatic events has been conducted formally for several more years within the adult population, and a number of theories concerning the etiology of PTSD have been suggested. Before theoretical insights can be gleaned from research on adult populations subjected to trauma however, the issue remains of whether it is appropriate to continue to assume that child PTSD is essentially the same disorder as that found in adults.

It is the purpose of this review to examine the theoretical understanding of children's and adolescents' reactions to trauma and how such an understanding may benefit from models of PTSD in adults. First, a brief critical review of theoretical accounts of PTSD in children and adolescents will be provided. Second, two recent cognitive models of PTSD in adults that have been shown to account for many of the key features of PTSD and have generated testable hypotheses will be outlined. Third, evidence concerning the pattern of reexperiencing observed in children will be considered. Fourth, the applicability of cognitive processes proposed in adult models of PTSD to PTSD in children and adolescents will be discussed. Fifth and finally, an examination will be provided of how the framework proposed within this paper may guide future research into children's and adolescents' reactions to trauma.

CURRENT UNDERSTANDING OF PTSD IN CHILDREN AND ADOLESCENTS

In this section, a brief overview will be provided of the most significant conceptualizations of PTSD in children and adolescents that have been offered over the past 15 years. The models were selected so as to provide an idea of the breadth of theoretical perspectives adopted so far in trying to understand children's responses to trauma, and the selection is by no means exhaustive.

Pynoos and colleagues (Pynoos, 1994; Pynoos, Steinberg, & Goenjian, 1996; Pynoos, Steinberg, & Piacentini, 1999; Pynoos, Steinberg, & Wraith, 1995) have considered children and adolescents' reactions to trauma within a developmental life-trajectory model. A child's short-term reaction to a trauma is considered to be moderated by four groups of factors: (i) proximal trauma reminders (e.g., external and internal cues, physiological reactivity); (ii) proximal secondary stresses (e.g., changes to family and community circumstances); (iii) the "ecology" of the child (e.g., parental, school, and peer factors); and (iv) factors intrinsic to the child (e.g., genetic predisposition, developmental competencies). In particular, it is argued that "the etiology of posttraumatic *distress*, [is derived from] the nature of the *traumatic experience*(*s*) and from the subsequent *traumatic reminders* and *secondary stressors*" (Pynoos, Steinberg, & Wraith, 1995, p. 72; the italics are the original authors). A child's long-term reaction and adjustment is likely to be related to ongoing reminders of the trauma and persistent secondary stressors (e.g., physical disability, judicial proceedings, etc.).

This conceptualization is important as it integrates existing psychodynamic, familial, cognitive–behavioral, and psychopharmacological approaches to children and adolescents' reactions to trauma, and leaves little doubt as to the dramatic impact of "the legacy of trauma." With regards to future research, Pynoos and colleagues advocate the investigation of a number of areas, including the development of brain mechanisms and how PTSD intersects with other anxiety disorders over the life span.

In a review of the literature concerning PTSD in children and adolescents, Fletcher (1996) adopted a multifactorial model similar to that of Pynoos and colleagues. Fletcher concluded that children react to trauma in a way very similar to that of adults, and called for further research to examine why it is that some children develop PTSD while others do not. He also stressed that factors other than those relating to exposure to trauma must be investigated.

Schwarz and Perry (1994) emphasized the neurobiological impact of a traumatic event, noting that acute stress results in the increased activation of the noradrenergic system, which plays an important role in a number of behaviors that are readily identified as being related to PTSD; arousal regulation, vigilance, irritability, locomotion, attention, sleep, and the startle response. The neurobiological changes thought to result from traumatic stress also "create an adaptive record of survival-related information" (Schwarz & Perry, 1994, p. 312). Such records, termed "malignant memories" by Schwarz and colleagues (Schwarz & Kowalski, 1991; Schwarz, Kowalski, & Hanus, 1993),

are hypothesized to possess a neural network architecture and incorporate information derived from the traumatic event that has a potential bearing on the individual's survival.

The activation of these memories by trauma-related cues results in the individual experiencing high levels of noxious arousal, and potentially, cognitive distortions, memory changes, dissociative states, and altered behavioral and affective activity. It is further noted from animal studies that the developing brain is particularly sensitive to stress, especially when such stress is unpredictable and uncontrollable. The authors proposed therefore that children exposed to trauma may develop brains with dysregulated neurophysiological systems and neuroanatomical structures that may leave them more vulnerable to suffering from exposure to psychosocial stressors when they reach maturity. The authors described how younger children exposed to trauma may experience a more pervasive and persistent increase in basal autonomic tone and develop a posttraumatic reaction where symptoms are elicited by more general stimuli that are unrelated to the trauma.

An integrative conceptual model that incorporated exposure to trauma, child characteristics (such as gender and age), access to social support, and coping styles was tested in a sample of elementary school-aged children exposed to a hurricane (Vernberg, La Greca, Silverman, & Prinstein, 1996). Vernberg et al. found that the four factors identified in the model were together able to predict a considerable amount of the variance in PTSD symptomatology. This study is of importance as it compares the relative importance of exposure variables to nonexposure variables such as social support and coping, and identifies specific targets for treatment (e.g., the use of blame and anger). Follow-up investigations of the same sample of children (La Greca, Silverman, Vernberg, & Prinstein, 1996) found that at 7 and 10 months after the disaster the model accounted for less variance in PTSD symptomatology. Although a considerable number of children thought they might die during the hurricane (60%), far fewer were hurt or actually witnessed other people being hurt during the event. The success of the model in predicting children's reactions may result partly from investigating a sample exposed to a comparatively moderate trauma where the protective effects of social support and coping may be more pronounced. Nevertheless, this study presents a significant advance in the methodology and theory used in the investigation of children's responses to trauma.

A number of reviews, while not proposing a specific model of PTSD in children and adolescents, have outlined etiological factors that have been shown to predict the occurrence of the disorder (Amaya-Jackson & March, 1995; American Association of Child and Adolescent Psychiatry, 1998; Foy, Madvig, Pynoos, & Camilleri, 1996; Gurwitch, Sullivan, & Long, 1998; Pfefferbaum, 1997; Vogel & Vernberg, 1993; Yule, Perrin, & Smith, 1999). The most widely accepted predictor of PTSD is exposure severity, while gender, prior exposure to trauma, prior psychiatric disorder, and family functioning also seem to be emerging as having predictive value. A less clear picture exists of the relationship between variables such as age and ethnicity and posttraumatic stress reactions.

A recent review has examined how a cognitive theory of childhood PTSD needs to accommodate developmental factors (Salmon & Bryant, 2002). The authors of this review highlight the need to consider developmental issues that have a bearing on how a child may encode and then resolve a traumatic experience. The development of language is thought to be of particular importance, both when a trauma is experienced and when a child attempts to deal with the traumatic event. The social world of the child is examined, and the role of the family in assisting a child to form complete memories of a trauma is stressed. The authors conclude by providing a relatively clear description of how developmental issues might be considered in both the assessment and treatment of children suffering from PTSD. The role of the family in both assessment and treatment is stressed, in particular the potential negative effect that parents may have in reinforcing a child's avoidant coping. Methods for supporting young children to communicate their experiences and the empirical support for providing such assistance are described.

The reviews described above have demonstrated how the understanding of children and adolescents' reactions to traumatic experiences has advanced to incorporate theory from a variety of domains. Many studies have been directed at examining core assumptions regarding the nature of PTSD in children, such as the pattern of symptomatology observed in children following trauma. The need for further research into a number of aspects of children's reactions is widely acknowledged. Yet, it remains the case that such research is rarely driven by a coherent model that explains the processes that are involved in the formation of specific PTSD symptoms such as intrusive memories, flashbacks, and hyperarousal. The adoption of

such a theoretical account may offer clearer guidelines as to how research may be directed beyond examining demographic and psychosocial variables.

Clearly, a theoretical account of PTSD in children and adolescents will need to be able to encompass the full range of aberrations of behavior, cognition, physiology, and consciousness that are associated with PTSD within a developmental context. Existing models have demonstrated a degree of success in accounting for these aberrations, yet inadequacies are also present. For example, Schwarz and Perry (1994) considered the role of developmental neurobiology with regard to specific PTSD symptoms. Similarly, Salmon and Bryant (2002) placed their discussion of childhood PTSD in the context of "fear networks" (Foa, Steketee, & Rothbaum, 1989). However, the kinds of single-level representations of emotion proposed within these accounts are limited in their explanatory power (Power & Dalgleish, 1997), especially with regards to some of the more disturbing symptoms of PTSD, such as flashbacks and emotional numbing; such accounts cannot explain the discontinuity between the reexperiencing of traumatic events, where adults and children may experience overwhelming sensations as experienced at the time of the trauma, and the normal, voluntary activation of autobiographical memories. In the next section two cognitive models of PTSD in adults that assume multilevel representations of traumatic events are outlined, which may also inform the development of a model of PTSD in younger people.

COGNITIVE MODELS OF PTSD IN ADULTS

Two models of PTSD in adults have had a tremendous impact on the understanding of the disorder in recent years. This more recent generation of models of PTSD, in addition to overcoming the problems associated with single-level theories of emotion as outlined above, provide more powerful explanations of the time course of reactions to traumatic events and individual differences in the nature of such reactions.

In the first model to be considered here, that of Brewin, Dalgleish, and Joseph (1996), it is suggested that the complex pattern of symptomatology observed in individuals with PTSD could be explained by a dual representation model, where the memories of the traumatic event are stored in a manner different to that of normal memories. These memories remain in a sensory format and are hypothesized to be represented within different neural structures than are normal memories.

Brewin (2001) has presented evidence from a cognitive neuroscience perspective that suggests "traumatic memories" are laid down in a way that bypasses the hippocampus, the neural structure considered to be responsible for the encoding of memories within a temporal and spatial context. As a result of this difference in information processing, "the sensory (visual, auditory, olfactory, etc.), physiological, and motor aspects of the traumatic experience are represented in situationally accessible knowledge in the form of analogical codes that enable the original experience to be recreated" (Brewin et al., 1996, pp. 676–677). Such representations, termed "situationally accessible memories" (SAMs) by Brewin et al. (1996), are reexperienced as the result of elicitation through associative learning; trauma-related cues will be likely to trigger such reexperiencing. This qualitative difference in representation also means that traumatic memories are not easily accessible by conscious means.

Such an account gives a powerful explanation of the cardinal cluster of symptoms observed in individuals with PTSD: the reexperiencing phenomena. The difference in representation may account for how flashbacks are experienced frequently as dissociative states. The conscious activation of SAMs is thought to allow changes in such representations of a traumatic event, whereby conditioned emotional responses are extinguished through a process of "spontaneous or programmed habituation" (p. 678). Such habituation, and the associated normalization of attentional and memory biases, is responsible for decreasing the likelihood of intrusively reexperiencing the traumatic event.

However, the full resolution of a traumatic event may also be contingent on an individual's verbally accessible memory (VAM) of the event. VAMs are theorized to consist of representations of a person's conscious experience of a traumatic event, such as sensory features, emotional and physiological reactions, and the perceived meaning of the event. Significantly such a representation is likely to be subject to deliberate retrieval from an individual's store of autobiographical memories. Brewin et al. (1996) stressed that "secondary emotional reactions arising from subsequent conscious appraisal" (p. 682) may interfere with the emotional processing of a traumatic experience. Attributions of responsibility made after a traumatic event, leading to emotions such as guilt or anger, in addition to being distressing, may prevent

the habituation of fear when SAMs are activated. Therefore, the authors suggest that prior to the use of exposure treatment, such secondary emotions be addressed using cognitive techniques.

Brewin et al. (1996) go on to describe three endpoints of emotional processing that arise from the dual representation theory proposed. Completion or integration results when memories of the traumatic event have been fully "worked through," and are integrated with the individual's other memories and sense of self in the world. In particular, the individual will have habituated to their SAMs of the event. The presence of unremitting PTSD is termed "chronic emotional processing," and is thought to be associated with inability to integrate memories of the trauma. This may be the result of aversive secondary emotions, as described above, the lack of social support to assist processing of SAMs or VAMs, and ongoing trauma, among other causes. In addition to the symptoms of PTSD, an individual caught in this stage will continue to have attentional and memory biases toward trauma-related information, and develop more generalized secondary reactions. The final endpoint of processing, "premature inhibition of processing," results when the individual succeeds in avoiding the activation of unpleasant SAMs and VAMs. Although the triggering of negative affect may be automatically avoided by the development of "avoidance schemas," the individual will continue to have attentional biases, impaired memory for the trauma, avoidance for trauma-related stimuli, and possibly somatization.

The second of this new generation of models of PTSD in adults is that of Ehlers and Clark (2000). Ehlers and Clark (2000) based their model on a dual representation format very similar to that of Brewin et al. (1996), but elaborate on both the pathological role of "trauma memory" (their term for Brewin et al.'s "SAMs"), and the cognitions, metacognitions, and thought control strategies considered responsible for the maintenance of PTSD. Ehlers and Clark argued that the combination of trauma memory and the negative appraisal of trauma and its sequelae result in a perception of "current threat" that is accompanied by intrusive phenomena, hyperarousal, anxiety, and other emotional responses.

Ehlers and colleagues have demonstrated the maintaining effect of a sense of "current threat" in victims of physical and sexual assault (Dunmore, Clark, & Ehlers, 1999), political prisoners (Ehlers, Maercker, & Boos, 2000), and motor vehicle accident (MVA) survivors (Ehlers, Mayou, & Bryant, 1998; Steil & Ehlers, 2000). In addition to the presence of poorly elaborated trauma memories (the recall of which is easily triggered by associated cues), a number of cognitions and metacognitions are thought to give rise to this mental state. These include dysfunctional meaning attached to symptoms of the trauma (e.g., believing that having flashbacks is a sign that one is "going mad"); perceived negative responses from others (e.g., "people think I am too weak to cope on my own"); a sense of permanent change (e.g., "my life is ruined"); and change in global beliefs (e.g., "the world is a dangerous place").

The power of metacognition to impede recovery from the acute phase of the disorder was demonstrated by Steil and Ehlers (2000) in their finding that the distress caused by reexperiencing symptoms of MVAs was related to the idiosyncratic meaning assigned to the symptoms (e.g., believing that intrusive thoughts are a sign that one is going "mad"). This relationship existed regardless of intrusion frequency, accident severity, and general anxiety-related catastrophic cognitions. In addition, dysfunctional meaning attached to traumatic symptoms was found to be associated with maladaptive coping strategies such as avoidance, thought suppression (an active effort to rid one's mind of a cognition), rumination, and distraction. These strategies are considered to discourage the full processing of traumatic memories, and in the case of thought suppression, paradoxically encourage the production of distressing intrusive cognitions. A considerable body of work has shown that thought suppression (see Purdon, 1999, for a review) is responsible for an increase in the frequency of intrusive thoughts and memories.

Thus, cognitions and metacognitions that are formed after a traumatic event may promote the maintenance of PTSD in two ways. First, dysfunctional cognitions and metacognitions produce a sense that the trauma continues to have damaging implications, and consequently generate a feeling of apprehension. Second, the thought control strategies that result from these appraisals can discourage emotional processing of memories of the traumatic event. These cognitions and coping strategies may explain how a substantial proportion of traumatized adults emotionally engage in exposure treatments and yet do not proceed to habituation of the memories (Jaycox, Foa, & Morral, 1998). Therefore, Steil and Ehlers (2000) suggest that "therapeutic strategies aimed at identifying, restructuring, and changing the negative idiosyncratic meaning of posttraumatic intrusions should be helpful in alleviating posttraumatic symptomatology" (p. 555).

Ehlers and Clark (2000), like Brewin et al. (1996), consider exposure to be an integral part of cognitive–behavioral interventions for PTSD, but argue that the adoption of cognitive restructuring during reliving may be useful. In this way problematic appraisals associated with key moments of the trauma may be identified and discussed, and the full benefits of exposure can be attained. Although Ehlers and Clark expound more the potential role of cognitive techniques in the treatment of PTSD in adults, there exist, however, few significant conceptual differences between their model and that of Brewin et al. (1996). Each accounts for the extreme nature of the reexperiencing symptoms of PTSD, and the variation in outcome between survivors of trauma. In particular, the onset and maintenance of PTSD symptomatology are distinguished. The early onset of intrusive phenomena is considered a normal reaction to an extreme event (especially after more severe trauma). The maintenance of such symptoms is considered to result from a variety of maladaptive responses.

THE NATURE OF CHILDREN AND ADOLESCENTS' MEMORIES OF TRAUMA

Although children and adolescents have been found to possess the same two-factor structure of reexperiencing and avoidance observed in adults (Dyregrov, Kuterovac, & Barath, 1996), particular consideration must be given to children's memories of traumatic events. Theorists positing a cognitive approach to PTSD in adults (Brewin et al., 1996; Ehlers & Clark, 2000) regard the reexperiencing phenomenon of the disorder not only to be its primary distinguishing feature, but also to be indicative of the central underlying abnormality that is responsible for the disorder: the nature of the memories of a traumatic event. These and other authors (e.g., van der Kolk, 1996) argue that traumatic events may be poorly encoded in memory, resulting in primitive representations of events. In addition such representations may also play a considerable role in maintenance of the hyperarousal cluster of symptoms, as the physiological changes encoded during the traumatic event are reexperienced.

It is essential therefore to consider whether the reexperiencing symptoms children experience are like those of adults; that is, such symptoms are the result of triggering involuntary recall of poorly elaborated, sensory-based memories of the traumatic event. With regard to this, there is a growing body of research regarding the elicitation, form, and treatment of traumatic memories in children. Three avenues of research have addressed the issue of the existence and role of traumatic memories in children and adolescence: clinical reports of children's memories of traumatic events, symptomatology profiles of samples of children exposed to trauma, and studies that have examined specifically the nature of children's memories of traumatic events.

Clinical Reports of Children's Memories of Traumatic Events

The landmark case studies conducted into children's reactions to traumatic events examined 5–14-year-old children involved in the Chowchilla bus kidnapping (Terr, 1981). Terr reported the presence of some symptoms that would be considered to fit *DSM-IV* criteria for reexperiencing: Nightmares or bad dreams with some content pertaining to the kidnapping, "posttraumatic play," and behavioral reenactment. Flashbacks, however, were not observed in the children. Terr described how older children reported daytime visions of the kidnapping, but suggested that these reexperiencing episodes were voluntary.

In a 4-year follow-up study of these children, Terr (1983) reported that their memories of the kidnapping were largely unchanged, and that such memories were still recalled with a "vivid immediacy." A significant number continued to engage in posttraumatic play and behavioral reenactment, a variant of posttraumatic play that was considered to be less "fun," and very often involved the reexperiencing of psychophysiological responses experienced during the kidnapping. Behavioral reenactment is a feature of children's reactions to trauma that may be readily conceptualized within the dual representation theory of Brewin et al. (1996) as the elicitation of motor responses recorded during the trauma.

Perrin, Smith, and Yule (2000) share the view that children and adolescents can suffer from intrusive thoughts about a traumatic event, adding that such phenomena can occur either when falling asleep or when triggered by external or internal reminders. Perrin et al. (2000) also briefly overview the debate regarding the reactions of very young children to trauma, noting that although evidence exists to suggest that this group does not suffer from visual flashbacks, they can display signs of reexperiencing through vivid reenactment of the trauma

(Scheeringa & Zeanah, 1995; Scheeringa, Zeanah, Drell, & Larrieu, 1995). In short, many clinical reports note that children "re-see" or "re-feel" the trauma (Terr, 1991) and acknowledge the different sensory modalities that such experiences may take.

Symptomatology Profiles of Samples of Children Exposed to Trauma

Beyond clinical reports, a number of studies have shown that the full range of reexperiencing symptomatology is found in children and adolescents who have been exposed to traumatic events. A meta-analysis conducted by Fletcher (1994) examined 34 studies of children exposed to trauma (with a total sample size of 2,697) and found similar rates of PTSD in child and adult samples. Fletcher (1996), in discussing these findings, concluded that the *DSM-IV* diagnosis of PTSD could be applied to all child age groups. Although the pattern of symptomatology in Fletcher's meta-analysis for preschool children appears to be different to that of school- and teen-aged children (with preschool children found to be more frequently distressed by reminders of the trauma, have bad dreams regarding the trauma, and engaging in posttraumatic play), this meta-analysis does underscore the general acceptance that children reexperience traumatic events.

Quantitative Studies of Children's Memories of Traumatic Events

The finding that children and adolescents experience unwanted thoughts of traumatic events, have "flashbacks" (albeit not young children), and experience physiological arousal on exposure to trauma-related cues, supports the suggestion that children and adolescents can form SAMs of traumatic events. Further evidence suggesting that some children's memories of traumatic events are comparable to the concept of SAMs comes from the few studies that have sought to assess the nature of these memories in children quantitatively.

Burgess, Hartman, and Baker (1995) adopted a conceptual framework that incorporated neurobiological, information processing, and psychodynamic approaches in their study of the memories of 34 physically and sexually abused children. The somatic, behavioral, verbal, and visual qualities of the children's memories were examined. Somatic and behavioral memories of trauma were very common and clearly related to the sexual nature of much of the abuse that was endured by the children in this sample. Most children's memories had a visual quality, though this finding was based on noting whether children were able to draw elements of the trauma they were exposed to. Such an indicator is likely to be highly insensitive due to children's lack of artistic ability or unwillingness to draw their experiences. Verbal memories were of a varying quality, though only three children expressed no memory at all of what happened to them.

Further data concerning the quality of children's memories of trauma have been obtained from one study of pre-school-aged children exposed to an extreme natural disaster. Azarian, Lipsitt, Miller, and Skriptchenko-Gregorian (1999) assessed 90 children, aged 10–44 months, after the 1988 Armenian earthquake. More than half of the sample had verbal memories of the earthquake, and nearly all displayed what the authors termed "nonverbal" memories: repetitive earthquake-related play, nightmares, and physiological and somatic reactions that were produced in reaction to specific reminders of the earthquake. An important finding of this study was that memory quality varied across the age range. The youngest age group, that of children aged 10–24 months, contained significantly fewer children with verbal memories than did the two older groups, while the rates of nonverbal memory presentation remained approximately equal across the age span.

The two studies discussed above lend weight to the possibility that children exposed to trauma can have nonverbal memories similar to the SAMs described by Brewin et al. (1996). It is noteworthy that Azarian et al. (1999) found that very young children had no verbal memories of the earthquake that they were exposed to, yet possessed nonverbal memories at the same rate as older children did. That such young children lack verbal memories is entirely in keeping with their linguistic development (see Salmon & Bryant, 2002, for further discussion of this). However, if the ability to form verbal memories is a protective one would have expected this group to demonstrate more nonverbal memories than did older children, who with their more developed linguistic and cognitive abilities may have been more able to process the traumatic event. Brewin and colleagues note that adults with PTSD following a trauma may have some verbal account of the event, but that such accounts are likely to be fragmentary and more biased to describing sensory rather than semantic aspects of what occurred.

In conclusion, it is suggested from the existing evidence that Brewin et al.'s (1996) concept of SAMs may be of explanatory relevance to children's reactions to trauma. Like adults' reexperiencing of traumatic events, children are likely to possess emotion-laden memories composed of sensory fragments, that are easily elicited by reminders of the event, and can be experienced in the present as intrusive memories and "flashbacks." Further studies of the memories of a greater age range of children are necessary to investigate this proposal. These should include prospective studies that examine the relationship between memory quality and PTSD symptomatology.

The finding of Azarian et al. (1999) that the presence of verbal memories in young children may be protective against the development of nonverbal memories is in particular need of replication. If this is the case, then other barriers to the formation of coherent and nonintrusive memories other than linguistic ability will need to be investigated, such as emotional regulation and willingness to confront fear-eliciting internal or external stimuli. Indeed, one of the advances of the recent adult cognitive models of PTSD is the realization that although verbalizing a traumatic event is a necessary step in the processing of the event, other aspects of the traumatic memory also may need to be modified. Commentators on PTSD in children have drawn attention to young children's limited ability to encode an event in a verbal form (Fivush, 1998; Salmon & Bryant, 2002). Future studies may be beneficially directed toward other aspects of children's memories of trauma. Similarly, dissociation, which is considered to play a significant role in the onset of PTSD in adults by interfering with the process of forming a coherent memory of a traumatic event, has received little attention in studies of children and adolescents exposed to trauma.

COGNITIVE AND METACOGNITIVE PROCESSES INVOLVED IN THE MAINTENANCE OF PTSD IN CHILDREN AND ADOLESCENTS

Among the most significant advances brought about in the adult cognitive models of PTSD outlined above is their account of the time course of the disorder. Accounting for the time course of PTSD is considered a necessary component for any model (Dalgleish, 1999). Such necessity seems to stem from the finding that at least for severe trauma such as rape, posttraumatic symptomatology in the immediate aftermath of such an event may be common (Rothbaum, Foa, Riggs, Murdoch, & Walsh, 1992).

Dunmore, Clark, and Ehlers (1999, 2001) argued that factors responsible for the onset and maintenance of PTSD in adults are rarely distinguished in the literature, and that cognitive factors may play as significant a role in these aspects of the time course of PTSD as do pretraumatic and peri-traumatic experiences. Both Brewin et al. (1996) and Ehlers and Clark (2000) acknowledge that the onset of posttraumatic symptomatology may be strongly related to the quality of the memory laid down during the traumatic event, and argue that those individuals who suffer from more chronic PTSD are prevented in some way from processing such memories. This suggestion accounts for the finding that for many individuals the symptoms of PTSD are fleeting, whereas for others the disorder can last for many years.

In the rest of this section, an examination of the kinds of cognitive processes that may be involved in the *maintenance* of PTSD in children and adolescents is examined. Appraisal, metacognitive, and information-processing aspects of cognition will be considered. First, however, a caveat must be highlighted regarding the adoption of an onset–maintenance approach to PTSD in children and adolescents. Although a growing body of research suggests that, as in adults, stress reactions in the immediate aftermath of a traumatic event may be quite common but diminish rapidly for most individuals (American Academy of Child and Adolescent Psychiatry, 1998; Mirza, Bhadrinath, Goodyer, & Gilmour, 1998; Yule et al., 2000), such findings should still be considered as tentative, especially in the case of young children who have been the subject of relatively few prospective studies.

Secondary Emotions

In the aftermath of a traumatic event, adults may develop what Brewin et al. (1996) term secondary emotions. According to these theorists, strong secondary emotions such as guilt and anger may interfere with the processing of traumatic memories by preventing a reduction in affect when traumatic memories are activated. Both anger and guilt (Goenjian, 1993; Gurwitch et al., 1998; Pynoos & Nader, 1988; Schwarz & Kowalski, 1991) are common reactions to trauma observed in children. To date both guilt (Pynoos et al., 1987) and anger (Vernberg, La Greca,

Silverman, & Prinstein, 1996) have been shown to be associated with PTSD.

Thought Control Strategies

As discussed in detail above, the cardinal symptoms of PTSD are distressing intrusive thoughts, feelings, and images, through which the individual "reexperiences" the traumatic event. The way in which an individual responds to these reexperiencing phenomena can have significant repercussions; an important feature of Ehlers and Clark's model of PTSD is that maladaptive thought control strategies, such as rumination and thought suppression, paradoxically increase the frequency of the intrusions (Ehlers & Clark, 2000). Unlike other forms of avoidance that would appear to hinder the processing of traumatic memories, such as distraction, thought suppression would appear to actually exacerbate the reexperiencing symptoms.

Only two articles have evaluated the role of thought suppression in children with PTSD. In a study of 40 children exposed to MVAs, aged between 8 and 7 years old (mean age 13.6), Aaron, Zaglul, and Emery (1999) found that nearly one quarter of the exposed children developed PTSD (according to *DSM-IV* criteria). In a regression analysis of the assessed variables, only fear at the time of the traumatic event and thought suppression were found to be significant predictors of PTSD 1 month posttrauma, where greater fear and the greater endorsement of thought suppression were associated with worse symptoms.

Certain flaws are apparent in this study, most notably the use of a scale that includes intrusion items in addition to thought suppression items (the White Bear Suppression Inventory; Wegner & Zanakos, 1994), a small sample size, and that the children were assessed only at 1 month posttrauma. Nevertheless the study used both the key posttraumatic stress self-report measures available for use with children (the IES and the PTSD-RI), and included a suitable control group (non-MVA attendees at an accident and emergency department). Ehlers, Mayou, and Bryant (in press) also offer support for the role of thought suppression in their study of children involved in MVAs, where a single item assessing this strategy was found to be a significant predictor of PTSD at both 3 and 6 months posttrauma.

Dissuading a child from the use of thought suppression is a simple target for treatment. However further research is necessary to discover if thought suppression leads to an increase in the frequency of intrusive cognitions, as has been demonstrated in adults. Gaskell, Wells, and Calam (2001) demonstrated that the standard experimental thought suppression paradigm is workable with children aged 7–11 years, while also finding that this thought control strategy was not responsible for an increase in intrusive thoughts.

Other thought control strategies, such as distraction, which may not exacerbate the occurrence of intrusive thoughts and memories but may still delay the processing of traumatic memories, are worthy of investigation. Stallard, Velleman, Langsford, and Baldwin (2001) found that in their sample of 97 children aged 7–18 years who had been involved in MVAs, the use of distraction was associated with a diagnosis of PTSD at 6 weeks after the accident, though was not predictive of PTSD at 8 months posttrauma. Very little is known about the developmental course of thought control strategies with regard to PTSD or any other anxiety or depressive disorder. Unfortunately, the avoidance cluster of symptoms within the *DSM-IV* classification of PTSD includes one symptom for the avoidance of thoughts, feeling, and conversations associated with a traumatic event; this crude grouping may mask important differences between adults and children in the use of what are quite distinguishable avoidant strategies. The findings of Aaron et al. (1999) and Ehlers et al. (in press) suggest that more detailed research regarding the varieties of cognitive avoidance is warranted.

Negative Interpretation of Intrusive Symptoms

One factor only recently identified within the domain of adult PTSD is the interpretation of posttraumatic symptoms, in particular the intrusive symptoms (see Steil & Ehlers, 2000). For example, the occurrence of flashbacks may be seen by the individual as a sign that he or she is suffering from brain damage or "going mad." Emotional numbness may be interpreted as indicating future unhappiness, as a result of being unable to form a close relationship with anyone (for further examples, see Ehlers & Clark, 2000).

In addition to further enhancing a sense of current threat, such cognitions also promote use of maladaptive thought control strategies, such as thought suppression (see earlier). At present few studies in children have formally acknowledged the potential role of such interpretations. Terr (1983) noted that one of the Chowchilla bus kidnapping children had

developed a fear of being afraid, a process that is related to the interpretation of symptoms. The only specific test of the role of these kinds of appraisals is that of Ehlers et al. (in press) where the appraisal of the self as going mad was associated with PTSD symptomatology at both 3 and 6 months posttrauma.

A concept that has been more readily applied to child psychopathology is that of anxiety sensitivity. Anxiety sensitivity is the construct of tending to catastrophise or overinterpret signals of anxiety. Within adults, this construct has been identified as being closely associated with certain anxiety disorders (Taylor, Koch, & McNally, 1992). Within children, the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991) has been used to account for a significant proportion of variance on measures of children's fears and trait anxiety, which could not be explained by anxiety frequency. Increasingly evidence has suggested that this construct is a unique predictor of trait anxiety, and has potential implications for the assessment and treatment of anxiety (Mattis & Ollendick, 1997; Silverman & Weems, 1999).

With regard to the psychopathology of PTSD in children, no study has examined specifically the role of anxiety sensitivity, though two studies have examined the role of anxiety sensitivity in a group of children with a number of anxiety disorders (Chorpita, Albano, & Barlow, 1996; Weems, Hammond-Laurence, Silverman, & Ginsburg, 1998). Although there is some disagreement over the age at which anxiety sensitivity might influence general anxiety and fearfulness (where Silverman & Weems, 1999, argue persuasively in support of their finding that younger children are affected by their anxiety sensitivity), the emerging consensus is that by 11–12 years children possess the cognitive capacity to be concerned with abstract objects of fear, such as going crazy, losing control, or death. In each of these studies, however, the number of children with PTSD was very small. This preliminary evidence that the construct of anxiety sensitivity is important in the development of anxiety disorders in children suggests that there is a pressing need to investigate metacognitive processes in pediatric PTSD.

Rumination

Ehlers and Clark (2000) describe how individuals involved in a traumatic event may ruminate over issues such as how the event could have been prevented, and how justice or revenge might be achieved. They also propose four ways in which rumination may maintain PTSD: through strengthening maladaptive appraisals of the trauma, interfering with the processing of traumatic memories, increasing feelings of anxiety and hopelessness, and providing more internal cues to intrusive traumatic memories.

Within child and adolescent populations, very few studies have examined children and adolescents' use of rumination. Broderick (1998) assessed children aged between 9 and 12 years for their responses to academic, family, and peer problem situations, and found that girls used rumination as a means of coping with stressors more than did boys. Studies examining the role of rumination in child psychopathology are even more scarce, in particular with regard to child's reactions to trauma. Some studies have demonstrated that the attributions children and adolescents form concerning the causes of a traumatic event can influence the development of posttraumatic symptomatology (Joseph, Brewin, Yule, & Williams, 1993), though very little research has examined the repetitive kind of preoccupation identified by Ehlers and Clark (2000). One study has examined rumination and PTSD in children, that of Ehlers et al. (in press), who found that two items pertaining to ruminative styles (thinking about the trauma over and over, and wondering why the trauma happened to them) predicted the maintenance of PTSD symptoms.

Broderick's study (Broderick, 1998) makes apparent individual differences in the use of rumination among prepubescent children, and given the importance attached to rumination by recent studies of PTSD in adults (Clohessy & Ehlers, 1999; Dunmore et al., 1999; Ehlers et al., 1998), further research in children exposed to traumatic events is warranted. In particular such research may need to examine whether specific cognitions such as those identified by Ehlers et al. (in press) result from an individual's more global "behavioral–attentional style" (Nolen-Hoeksema, 1991).

"Current Threat," Worry, and Attentional Biases

Following a traumatic event children suffering from PTSD are likely to have elevated levels of anxiety (Ellis, Stores, & Mayou, 1998; Lonigan, Shannon, Taylor, Finch, & Sallee, 1994; Vogel & Vernberg, 1993). Such anxiety is likely to be the result of a number of factors, but whatever the causes, ongoing anxiety is considered by most theorists to impair the successful processing of traumatic memories;

accessing emotion-laden memories of a traumatic event is unlikely to produce clinical improvement if no extinction of fear can occur (Foa, Steketee, & Rothbaum, 1989).

Ehlers and Clark (2000) describe how adults with PTSD often possess a particular form of anxiety that they term "current threat" (see above). These authors consider this state to be strongly related to various beliefs that an individual holds regarding their present condition and their more global worldview. A discussion of the possible role of children and adolescents' views of their own symptomatology has been given above. With regard to their more global assumptions, a recent study by Bishop (2001) found that a traumatic event has little bearing on a child's "assumptive world" (Janoff-Bulman, 1989); indeed the absence of a relationship between the child's beliefs about the world and their levels of anxiety and depression is taken to suggest the fascinating possibility that "children may deal with traumatic events by subsequently rejecting assumptions about the world that threaten their sense of security" (p. 404).

An early study into children's fears following a traumatic event (a lightning strike at a boy's football match) demonstrated that, not unsurprisingly, the children exposed to the tragedy were more likely than control groups to have fears and worries regarding a number of phenomena. These phenomena included lightning and thunderstorms, disasters, death and dying, as well as other events and situations that were not so related to the event they were exposed to, such as animals and the supernatural (Dollinger, O'Donnell, & Staley, 1984). Although such fears may result from amendments to a child's self-schema and external threat schemata (Kendall & Ingram, 1987; Kendall & Ronan, 1990), the intensity of such fears also may be aggravated by worrying.

Vasey (1993), following the work of Borkovec, Shadick, and Hopkins (1991), defined worry as "an anticipatory cognitive process involving repetitive thoughts and images that contain fear-producing content related to possible traumatic events and their potentially catastrophic implications (p. 7)." Such a process is likely to play a significant role in enhancing specific fears following a traumatic event, in addition to maintaining a generally anxious mood. Vasey's consideration of childhood worry centers largely around the role of children's cognitive development, acknowledging that worry requires the ability both to anticipate future events as well as the related ability "to go beyond what is observable and consider what is merely possible"(Vasey, 1993, p. 9). Before a child is 7–8 years of age, he or she is unlikely to be able to consider the future (Piaget & Inhelder, 1966), though at the slightly earlier age of 5–6 years children have been found to produce anticipatory thoughts of threat (Vasey, 1991).

For the child who already has experienced an extremely frightening event, it may be considerably easier to conceive of future threats, as demonstrated in the study of Dollinger et al. (1984). For children exposed to trauma, worry may be directed toward the prevention of the reoccurrence of an experienced event. In adult populations, it has been proposed that beliefs regarding the importance of worry, especially as a way of coping with future anticipated threats, play a key role in the maintenance of high levels of anxiety (GAD; Wells, 1995). The role of the metacognitive beliefs outlined by Wells (1995) have not yet received attention with regard to childhood anxiety disorders, yet Vasey (1993) has acknowledged that the role of children's beliefs concerning their own problem solving skills and cognitive states are related to uncontrollable worry. Future research directed at examining children's beliefs regarding worry could highlight how children think about the future following trauma and whether an endorsement of worry may maintain elevated levels of anxiety and contribute to the maintenance of PTSD.

For some time it has been known that following a traumatic event adults suffering from PTSD demonstrate an attentional bias (as measured using the modified Stroop task) toward trauma-related cues than do adults not suffering from PTSD (Cassiday, McNally, & Zeitlin, 1992; Foa, Feske, Murdock, Kozak, & McCarthy, 1991; Kaspi & McNally, 1991; McNally, Kaspi, Riemann, & Zeitlin, 1990; Thrasher, Dalgleish, & Yule, 1994). A variety of explanations has been proposed for why such a bias occurs (see Thrasher & Dalgleish, 1999, for a review), but no clear account exists as to why different methodologies for examining attentional biases (e.g. the dichotic listening task; Trandel & McNally, 1987) do not demonstrate the same bias as conclusively. Brewin et al. (1996) view the presence of attentional bias as an indicator that SAMs of a traumatic event have not been processed and are accompanied by high levels of emotion.

Three studies involving samples of children exposed to traumatic events have investigated the role of attentional biases in this age group. Moradi, Taghavi, Neshat-Doost, Yule, and Dalgleish (1999), in a study using the modified Stroop task, found that children aged 9–17 years who had been exposed to traumatic

events such as MVAs or assaults, demonstrated an attentional bias toward trauma-related words, relative to neutral words and to children who had not been exposed to trauma. Unfortunately a sample of children who had been exposed to trauma but did not develop PTSD was not included in this study, and as the authors conclude, the children included in the study were old enough to have met all the significant cognitive developmental milestones. The same samples of children also performed the dot probe task (Dalgleish, Moradi, Taghavi, Neshat-Doost, & Yule, 2001). Children with PTSD selectively allocated attention toward socially threatening stimuli, and away from depression-related stimuli (no trauma-related stimuli were used).

Ribchester (2001) has overcome some of the failings of these studies into children's selective attention following trauma. Ribchester found that children suffering from PTSD who had been exposed to a MVA demonstrated greater response latencies toward trauma-related words on a modified Stroop task, relative to other word categories and a sample of children also exposed to MVAs but not suffering from PTSD. In addition to using an appropriate control group, this study also found that the threat-specific attentional bias was eliminated following treatment with eye movement desensitization and reprocessing (EMDR).

Although the findings from these studies are broadly consistent with others that have examined attentional biases in anxious children (Vasey, Daleiden, Williams, & Brown, 1995; Vasey, Elhag, & Daleiden 1996), it has not been demonstrated that such biases play a role in the maintenance of PTSD in either children or adults. It remains to be established whether attentional bias is a discrete cognitive process involved in the etiology and maintenance of PTSD, an experimental index of PTSD symptoms (e.g., hypervigilance), or, as Brewin et al. (1996) have suggested, an indicator of the presence of unprocessed SAMs.

CONCLUSIONS

It has not been the aim of this paper to outline the effects that trauma has on a child's development and distal psychopathology (see Pynoos et al., 1999, for such an account). This is not to say that trauma and PTSD do not have long-term developmental consequences for children, in terms of both psychopathology, and more general functioning such as school performance. The work of Bolton, O'Ryan, Udwin, Boyle, and Yule (2000) in the follow-up of children involved in the *Jupiter* disaster demonstrated that children are at a greater risk in the aftermath of a traumatic event of developing a range of anxiety and affective disorders, especially if they have PTSD. Rather, it has been the purpose of this paper to stress the need for a more detailed understanding of the precise mechanisms that govern the incidence and course of posttraumatic stress reactions, as well as how other psychopathology can result following a traumatic event.

The present paper has not been aimed at conclusively advocating any specific cognitive–behavioral model for the understanding of children and adolescents' reactions to trauma, but has argued that adopting a "dual representation" framework in attempting to understand PTSD in children and adolescents may be useful. It has been demonstrated that children with posttraumatic stress disorder possess both representations of traumatic events that fit within the notion of SAMs and verbally accessible memories and that incorporate maladaptive appraisals and "secondary emotions" that are associated with a worse outcome, the key aspects of the architecture described by both Brewin et al. (1996) and Ehlers and Clark (2000).

Adopting such a framework to the understanding of PTSD in children and adolescents offers specific directions for future research. First, predictions can be made regarding how the time course of PTSD varies according to a child's developmental stage. Very young children, who are largely dependent on their caregivers to appraise danger and for the formation of a coherent narrative of a distressing event (Salmon & Bryant, 2002), would be likely to form PTSD symptomatology in the short-term following a traumatic event (largely as a function of their caregiver's levels of distress and communication with their child); lacking the verbal ability and emotional regulatory capacities to process their SAM representations of the trauma, PTSD symptoms, if present, may remain at a stable level for a long period of time. Elementary school-aged children would be able to lay down more coherent memories of a trauma than would very young children. Those that do lay down the kinds of memories that give rise to reexperiencing and hyperarousal may be less likely to engage in strategies of coping that impair the processing of such memories, for example, cognitive avoidance, rumination, or worry, as they lack the more abstract cognitive abilities that motivate and enable the use of such coping. Older children and adolescents, like elementary school-aged children, would be able to appraise an

event as traumatic on their own and be more able to form a coherent memory of it represented in a verbal format. However, they are also more able to engage in maladaptive ways of coping, and so a significant minority of this age group, much in the same way as adults, would be likely to form chronic reactions to trauma.

Second, the role of the family, already demonstrated to be important in the development of PTSD in children and adolescents (Smith, Perrin, Yule, & Rabe-Hesketh, 2001), may be further investigated. In the context of a dual representation account of PTSD, a child's family may play a role in moderating PTSD at a number of points: by enabling a child to verbalize a traumatic event as it occurs, enabling the verbalization and emotional processing of a traumatic event in its aftermath, and influencing a child's appraisals and coping styles after a traumatic event.

Third, the role of pretraumatic psychological disorders in increasing the risk of PTSD (Asarnow et al., 1999; La Greca, Silverman, & Wasserstein, 1998) may be better understood. Preexisting elevated arousal may lead to a child laying down more emotion-laden memories and be related to the onset of PTSD, while the presence of maladaptive cognitive and metacognitive styles may play a role in the maintenance of posttraumatic symptomatology.

Fourth, the increased prevalence of emotional disorders in children and adolescents exposed to trauma may be further investigated. As has already been demonstrated in adults exposed to trauma (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999), a child's appraisals following a trauma may be associated with depression and anxiety, as well as posttraumatic symptomatology.

Fifth, our understanding of the role of verbal accounts of a trauma may be further informed. An examination of the literature on child and adult reactions to trauma highlights the need to understand the degree to which the remission of PTSD is related to the formation of verbally based memories of a traumatic event. Both the adult cognitive models outlined above and a number of theorists in the domain of child and adolescent PTSD (Fivush, 1998; Salmon & Bryant, 2002) have highlighted the need for individuals exposed to trauma to form a coherent memory of a traumatic event that is represented in a verbal format. In one study of adults treated for PTSD, using exposure it was found that the transformation of sensory and action-oriented descriptions of the traumatic event to meaningful and reflective accounts was associated with clinical improvement (Amir, Stafford, Freshman, & Foa, 1998). It is unclear whether it is the change in narrative structure that is associated with an improvement in posttraumatic stress symptomatology, or other factors that are influenced by exposure techniques, such as the extinction of conditioned fear responses.

Sixth, the importance attached to forms of cognitive avoidance by both Ehlers and Clark (2000) and Brewin et al. (1996) suggests that future research may be usefully directed toward understanding how children's use of thought control strategies varies across development. Research into children's use of other cognitive activities (such as worry and rumination) across development will further inform how maladaptive coping maintains PTSD.

The case for applying elements of adult approaches to psychopathology to the understanding of childhood emotional disorder has already been made, for example, the information processing perspective on anxiety (Daleiden & Vasey, 1997). However, there exists in this application of adult theory the danger that "the more the research is about psychopathology, the less it is about development" (Steinberg, 2002, p. 127). Adopting a dual representation framework does not preclude developmental considerations when understanding children's reactions to traumatic events. Rather, such a framework allows investigation into developmental influences on the specific processes that contribute to the onset and maintenance of PTSD.

Although considered the "first-line" approach to treatment, the "active ingredients" of cognitive–behavior therapy (CBT) for PTSD in children and adolescents have yet to be established (Cohen, Berliner, & March, 2000). Exposure treatments have been shown to be effective in child as well as adult populations (Saigh, Yule, & Inamdar, 1996), but the success of this treatment could be attributable to different therapeutic processes. As mentioned above, exposure treatment may allow a reduction in the negative affect and arousal incorporated in traumatic memories, modify the structure and form of the traumatic memory such that the memories are less likely to be triggered by external sensory stimuli, or both of these processes. The role of cognitive elements of CBT similarly needs clarification, and it is suggested that cognitive interventions will benefit from incorporating an understanding of children's cognitive-avoidant and metacognitive processes in the aftermath of trauma. The framework presented here for understanding elements of children's and adolescents' reactions to trauma may inform how cognitive

behavioral treatments might be improved and tailored to a child's development.

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accessing emotion-laden memories of a traumatic event is unlikely to produce clinical improvement if no extinction of fear can occur (Foa, Steketee, & Rothbaum, 1989).

Ehlers and Clark (2000) describe how adults with PTSD often possess a particular form of anxiety that they term "current threat" (see above). These authors consider this state to be strongly related to various beliefs that an individual holds regarding their present condition and their more global worldview. A discussion of the possible role of children and adolescents' views of their own symptomatology has been given above. With regard to their more global assumptions, a recent study by Bishop (2001) found that a traumatic event has little bearing on a child's "assumptive world" (Janoff-Bulman, 1989); indeed the absence of a relationship between the child's beliefs about the world and their levels of anxiety and depression is taken to suggest the fascinating possibility that "children may deal with traumatic events by subsequently rejecting assumptions about the world that threaten their sense of security" (p. 404).

An early study into children's fears following a traumatic event (a lightning strike at a boy's football match) demonstrated that, not unsurprisingly, the children exposed to the tragedy were more likely than control groups to have fears and worries regarding a number of phenomena. These phenomena included lightning and thunderstorms, disasters, death and dying, as well as other events and situations that were not so related to the event they were exposed to, such as animals and the supernatural (Dollinger, O'Donnell, & Staley, 1984). Although such fears may result from amendments to a child's self-schema and external threat schemata (Kendall & Ingram, 1987; Kendall & Ronan, 1990), the intensity of such fears also may be aggravated by worrying.

Vasey (1993), following the work of Borkovec, Shadick, and Hopkins (1991), defined worry as "an anticipatory cognitive process involving repetitive thoughts and images that contain fear-producing content related to possible traumatic events and their potentially catastrophic implications (p. 7)." Such a process is likely to play a significant role in enhancing specific fears following a traumatic event, in addition to maintaining a generally anxious mood. Vasey's consideration of childhood worry centers largely around the role of children's cognitive development, acknowledging that worry requires the ability both to anticipate future events as well as the related ability "to go beyond what is observable and consider what is merely possible"(Vasey, 1993, p. 9). Before a child is 7–8 years of age, he or she is unlikely to be able to consider the future (Piaget & Inhelder, 1966), though at the slightly earlier age of 5–6 years children have been found to produce anticipatory thoughts of threat (Vasey, 1991).

For the child who already has experienced an extremely frightening event, it may be considerably easier to conceive of future threats, as demonstrated in the study of Dollinger et al. (1984). For children exposed to trauma, worry may be directed toward the prevention of the reoccurrence of an experienced event. In adult populations, it has been proposed that beliefs regarding the importance of worry, especially as a way of coping with future anticipated threats, play a key role in the maintenance of high levels of anxiety (GAD; Wells, 1995). The role of the metacognitive beliefs outlined by Wells (1995) have not yet received attention with regard to childhood anxiety disorders, yet Vasey (1993) has acknowledged that the role of children's beliefs concerning their own problem solving skills and cognitive states are related to uncontrollable worry. Future research directed at examining children's beliefs regarding worry could highlight how children think about the future following trauma and whether an endorsement of worry may maintain elevated levels of anxiety and contribute to the maintenance of PTSD.

For some time it has been known that following a traumatic event adults suffering from PTSD demonstrate an attentional bias (as measured using the modified Stroop task) toward trauma-related cues than do adults not suffering from PTSD (Cassiday, McNally, & Zeitlin, 1992; Foa, Feske, Murdock, Kozak, & McCarthy, 1991; Kaspi & McNally, 1991; McNally, Kaspi, Riemann, & Zeitlin, 1990; Thrasher, Dalgleish, & Yule, 1994). A variety of explanations has been proposed for why such a bias occurs (see Thrasher & Dalgleish, 1999, for a review), but no clear account exists as to why different methodologies for examining attentional biases (e.g. the dichotic listening task; Trandel & McNally, 1987) do not demonstrate the same bias as conclusively. Brewin et al. (1996) view the presence of attentional bias as an indicator that SAMs of a traumatic event have not been processed and are accompanied by high levels of emotion.

Three studies involving samples of children exposed to traumatic events have investigated the role of attentional biases in this age group. Moradi, Taghavi, Neshat-Doost, Yule, and Dalgleish (1999), in a study using the modified Stroop task, found that children aged 9–17 years who had been exposed to traumatic